

Brigham City

Transportation Master Plan



DRAFT REPORT

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Brigham City

Transportation Master Plan

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1. Introduction

1.1. Background

William Davis, a Mormon pioneer settler, explored the area around Box Elder Creek in 1850 and returned the following year with his family and two other families to take up permanent residence. By the fall of 1853, eight families with a total of twenty-four people lived in the settlement.

In the October 1853 Mormon general conference, church president Brigham Young directed Lorenzo Snow, an apostle in the church, to take fifty families to the Box Elder area and develop a cooperative system in which the community would become self-sufficient, producing all that they consumed. Snow chose artisans skilled in trades important to the development of a pioneer community. Most were Mormon converts from Denmark.

Snow became the political and ecclesiastical leader of the community. In 1855 he had the town plat surveyed, renamed the settlement Brigham City after church president Brigham Young, and encouraged the people to build permanent homes. Several small businesses were established during the 1850s, and the Box Elder County Courthouse, under construction from 1855 to 1857, was used for city and county business, theatrical productions, and religious meetings until church buildings could be built.

By 1864 Lorenzo Snow was ready to implement his plans for a cooperative community. A mercantile store, established in 1864, was the first cooperative business, but soon many different types of industries and services were added. Workers were paid in scrip which could be used for trade in any of the departments of the cooperative. By the mid-1870s, the cooperative association was producing all the commodities necessary for maintenance of the community, and Snow had realized his goal of making the people of Brigham City independent of the outside world. His cooperative became a prototype for similar ventures in Mormon settlements throughout Utah. It was recognized as the first and most successful of the Mormon cooperative organizations. However, a series of financial disasters between 1876 and 1879 crippled the organization and forced the association to begin selling its industries to private businessmen. The Co-op went into receivership in 1895.

After the demise of the Co-op, private enterprise in the area flourished. By 1910 Brigham City's population was 4,000, and its residents were running local industries and retail businesses as well as operating farms. In the 1920s and 1930s Brigham City essentially remained a small Mormon agricultural town specializing in fruit production.

Bushnell General Hospital, built in 1942 to treat soldiers wounded in World War II, changed the quiet community. The sixty-building facility constructed on 235 acres brought a major boost to the economy. From the beginning of its construction until its close in 1946, Bushnell provided new jobs for local people. Farmers sold produce to the hospital, and business on Main Street increased with the influx of the hospital staff and patients. After Bushnell closed, from 1950 until 1984 the facility housed the Intermountain Indian School, a boarding school for young Indian students.

Brigham City's growth rate increased rapidly with the construction in 1957 of Thiokol Chemical Corporation's Wasatch Division, the largest manufacturing enterprise in Box Elder County's history. Brigham's population of 6,790 in 1950 increased to 11,720 in 1960, to

14,000 in 1970 and to 15,596 in 1980 as both Thiokol's solid-fuel motor production and number of employees expanded. By 1990 Brigham City's population was 20,000.

This historical overview was provided from <http://utahtravelcenter.com> in an article written by Kathleen Bradford.

1.2. Study Need

The City of Brigham has seen an 11.3% population increase within the last decade and just over .31% population increase the decade before. From 1960 to 2000, the population has increased 48.5%. Population in the Brigham area has gone through cyclical changes, but the overall trend shows very consistent increase in the population. Although population growth has slowed occurred in recent years, there was some discussion of Thiokol increasing employment due to the greater demand and the war efforts. These events may stimulate future growth in this area. A well-established transportation plan is needed to provide direction for continual maintenance and improvements to Brigham City's transportation system.

Brigham City has an adopted a General Plan. The Brigham City General Plan briefly describes the transportation needs of this area. With the aging infrastructure of Brigham's transportation system and the need for system improvements, a more extensive transportation plan is necessary for Brigham City and the surrounding area.

Some of the major transportation issues around the State are as follows:

- Safety
- Railroad crossings
- Trails (bicycle, pedestrian, & OHV)
- Signals
- City interchange aesthetics
- Connectivity of roadways
- Property access
- Truck traffic
- Alternate routes
- Speed limits

Brigham City recognizes the importance of building and maintaining safe roadways, not only for the auto traffic but also for pedestrians and bicyclists.

1.3. Study Purpose

The purpose of this study is to assist in the development of a transportation master plan for Brigham City. This plan could be adopted by Brigham City as a companion document to the city's General Plan. With the transportation master plan in place the city can qualify for grants from the State Quality Growth Commission.

The primary objective of the study is to establish a solid transportation master plan to guide future developments and roadway expenditures. The plan includes two major components:

- Short-range action plan

- Long-range transportation plan

Short-range improvements focus on specific projects to improve deficiencies in the existing transportation system. The long-range plan will identify those projects that require significant advance planning and funding to implement and are needed to accommodate future traffic demand within the study area.

1.4. Study Area

The study area includes Brigham City, and land adjacent to it that is in Box Elder County. A general location map is shown in Figure 1. A more detailed map of the study area and city limits is shown in Figure 2. The study area was developed by Brigham City and approved by the Brigham City Transportation Master Plan Technical Advisory Committee.

The roadway network within the study area includes I-15, US-89, US-91, SR-13, SR-38 & SR-90. Each of these roadways provides a vital function to Brigham City, to the rest of Box Elder County and to the State of Utah. I-15 connects all points north and South including Salt Lake City and the Utah/Idaho State Line. I-15 also connects to I-84 just to the North. I-15 is also a region commuter and commercial trucking route. US-91 connects areas to the East from I-15 including an important route to the Cache Valley and the City of Logan. US-89 connects the area to the South. This route is important as it provides an emergency route in times when I-15 is not available. SR-13 is the Main Street in Brigham City and serves local business and community circulation needs. SR-13 also serves the community to the west of Brigham City as it heads toward the West at the North end of town. From the point where SR-13 turns westward SR-38 connects to communities to the North. SR-90 connects Main Street to US-91 to the east and is an important route as it provides a central access from the downtown area. These roadways along with the local road network are shown in Figure 2.

1.5. Study Process

The study, which began in June 2004, is proceeding as a cooperative effort between Brigham City, UDOT, and local community members. It is being conducted under the guidance of Brigham City Officials. The following individuals participated in the initial meetings to provide input used to create this document. This group listed below will be referred to as the Technical Advisory Committee or “TAC” for this document.



Tree Lined Main Street



Mayor Christensen Addressing the Technical Advisory Committee

Lou Ann Christensen
Ed Skrobiszewski
John Adams
Holly Bell
Cliff Green
Alden Farr
Paul Larsen
Bryce Haderlie
Bruce Leonard
Ben Boyce
Don Tingey
Mike Johnson
Paul Tittensor
Mike Nelsen
Reese Jensen
Joe Siggard
Ken Kennedy
Jeff Packer
Fred Baugh
John Parson
Paul Glauser
Graig Woodland
Paul Damon
J. Dennis Whitaker
Nancy B Fuller
Ahmad Jaber
Charles Mace

Mayor, Brigham City
Mayor, Perry City
City Council
City Council
City Council
City Council
Planning & Economic Development Coordinator
Community Development Director
Public Works Director
Parks and Recreation Director
City Administrator
Street Supervisor
Police Chief
Lt. Police Department
Planning Commission
Planning Commission
Economic Development Board
Economic Development Board
Airport Board
Staker & Parsons Company
Staker & Parsons Company
Fife Rock Products
Fife Rock Products
Whitaker Construction
Standard-Examiner Reporter
UDOT Region One Director
UDOT Region One Project Manager

Figure 1: Brigham City Study Area Location

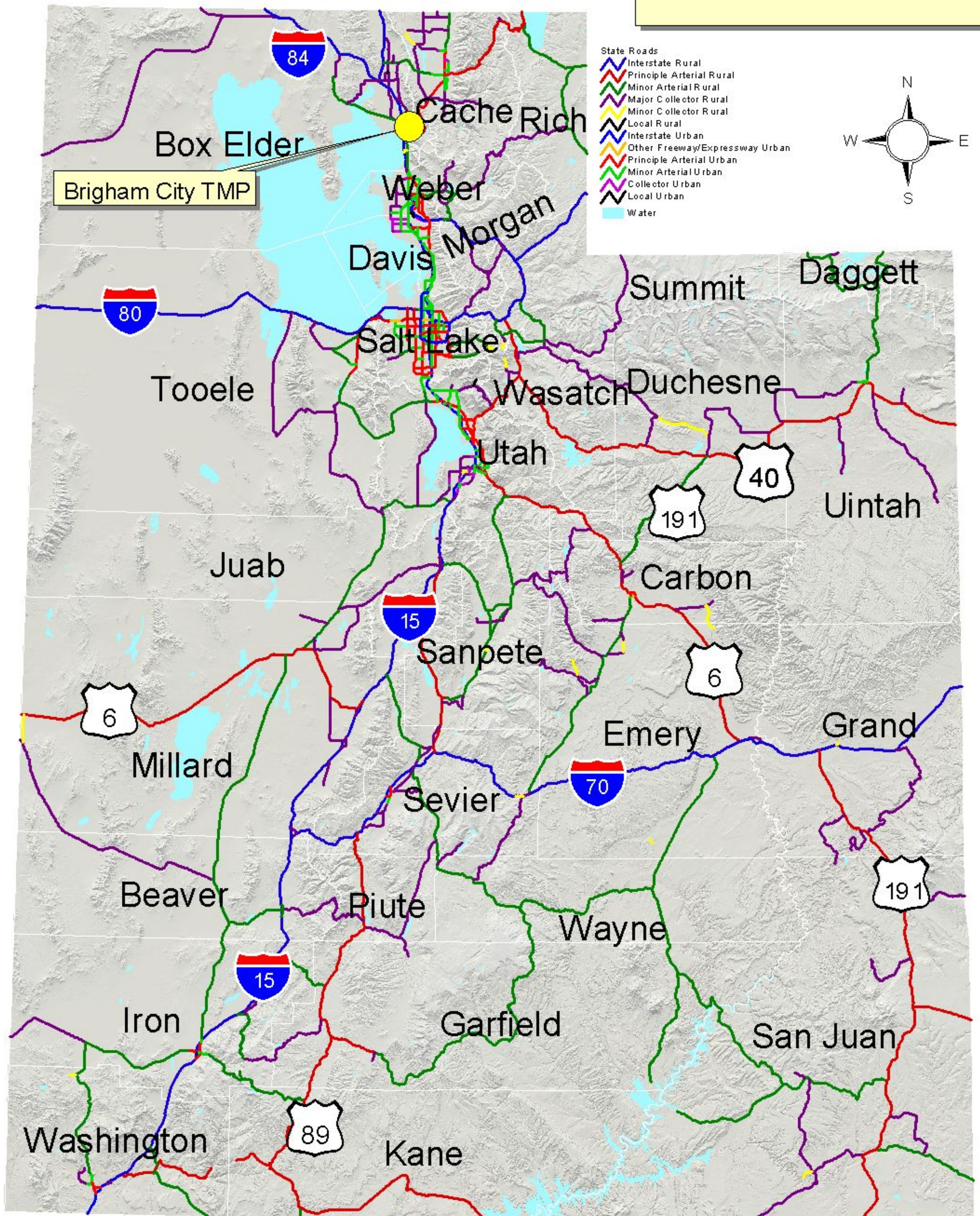
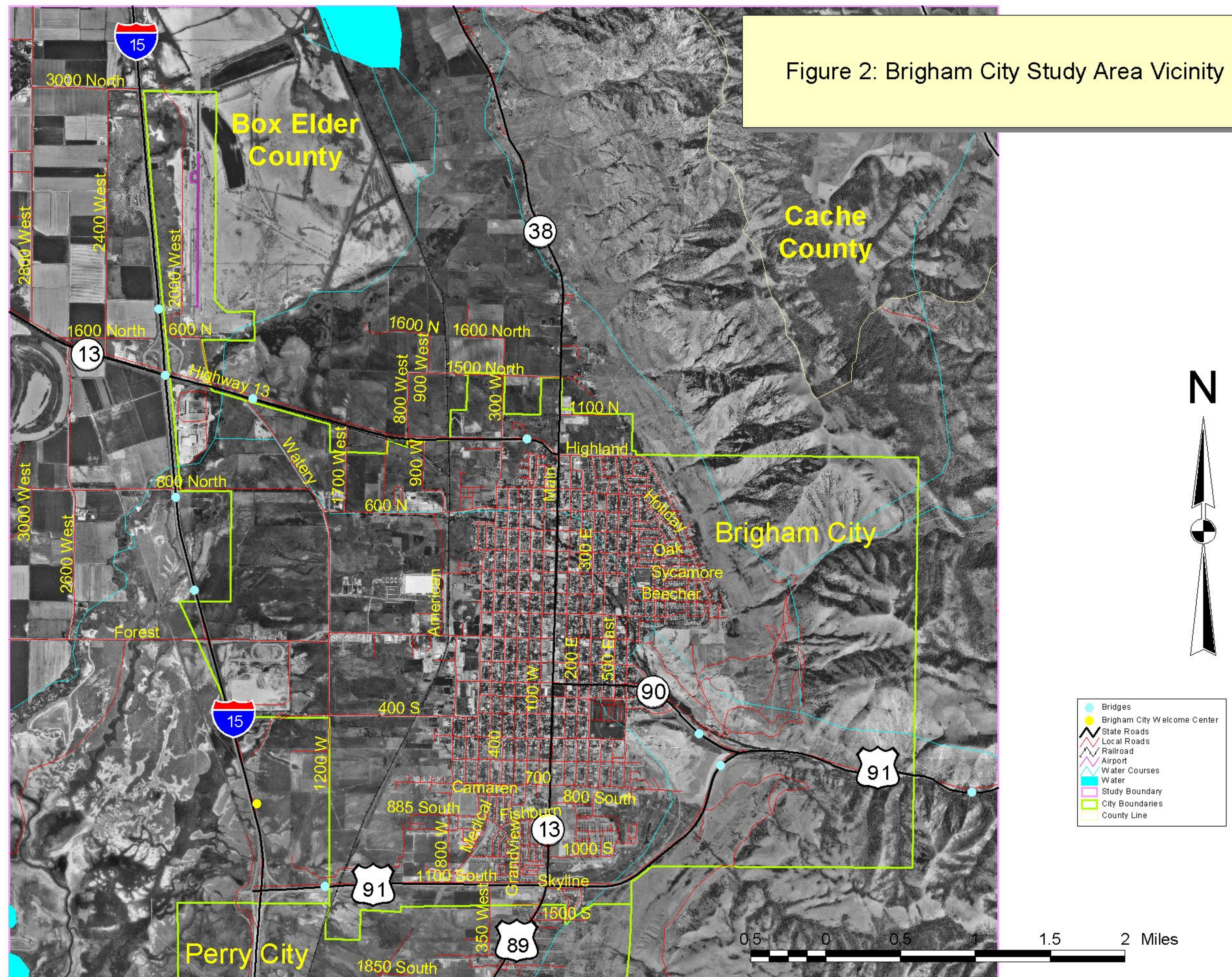


Figure 2: Brigham City Study Area Vicinity



The study process for the Brigham City Transportation Master Plan consist of three basic parts: (1) inventory and analyze existing conditions, (2) project future conditions, and (3) development of a transportation master plan (TMP). This process involves the participation of the TAC for guidance, review, evaluation and recommendations in developing the TMP to include development of future projects for the identified study area.



UDOT Staff addresses the Brigham City Technical Advisory Committee

The TAC will evaluate each part of the study process. Their comments will be incorporated into the study's draft final report. The remainder of the draft final report will focus on the recommendation and implementation portion of the transportation plan program. Transportation projects that will be recommended for the short-term and long-range needs will be developed based on the TAC's recommendations and concurrence.

The study process allows for the solicitation of input from the public at two TAC workshops. This public participation element is included in the

study process to ensure that any decisions made regarding this study are acceptable to the community.

The first TAC workshop will provide an inventory and analysis of existing conditions and identify needed transportation improvements. The second TAC workshop will focus on prioritizing projects, estimating costs, and discussion of the funding processes.

The TAC is expected to recommend those comments that are to be incorporated into the report and applicable to the goals of this study. The draft final report and the final report will be submitted to the City for review and comments.

Upon local review of the draft report, UDOT will prepare appropriate changes and submit the final report to the City for approval. The final report will describe the study process, findings and conclusions, and will document the analysis of the recommended transportation system projects and improvements.

2. Existing Conditions

An inventory and evaluation of existing conditions within the study area was conducted to identify existing transportation problems or issues. The results of the investigation follow.

2.1. Land Use

In order to analyze and forecast traffic volumes, it is essential to understand the land use patterns within the study area. Chapter 2 of Brigham City General Plan outlines land use classifications and annexation plans. Much of the City is zoned Residential, but there are also many issues dealing with commercial and industrial properties. The three gravel extractive industries operating on the east side of Brigham City also create special transportation issues as present routes unavoidably take these vehicles through the downtown, creating conflicts with pedestrians and other traffic. By analyzing the

patterns or changes in land use, we can better predict the ever-changing transportation needs.



Downtown Brigham City, Main Street and Forest Street

The Brigham City Zoning map follows on the next page.

2.2. Environmental

In Utah there are a variety of local environmental issues. Each of the cities and counties need to look at what are the environmental issues in their areas on a case-by-case basis. There are many resources that can help local entities to determine what issues need to be addressed and how any problems that may exist can be resolved.

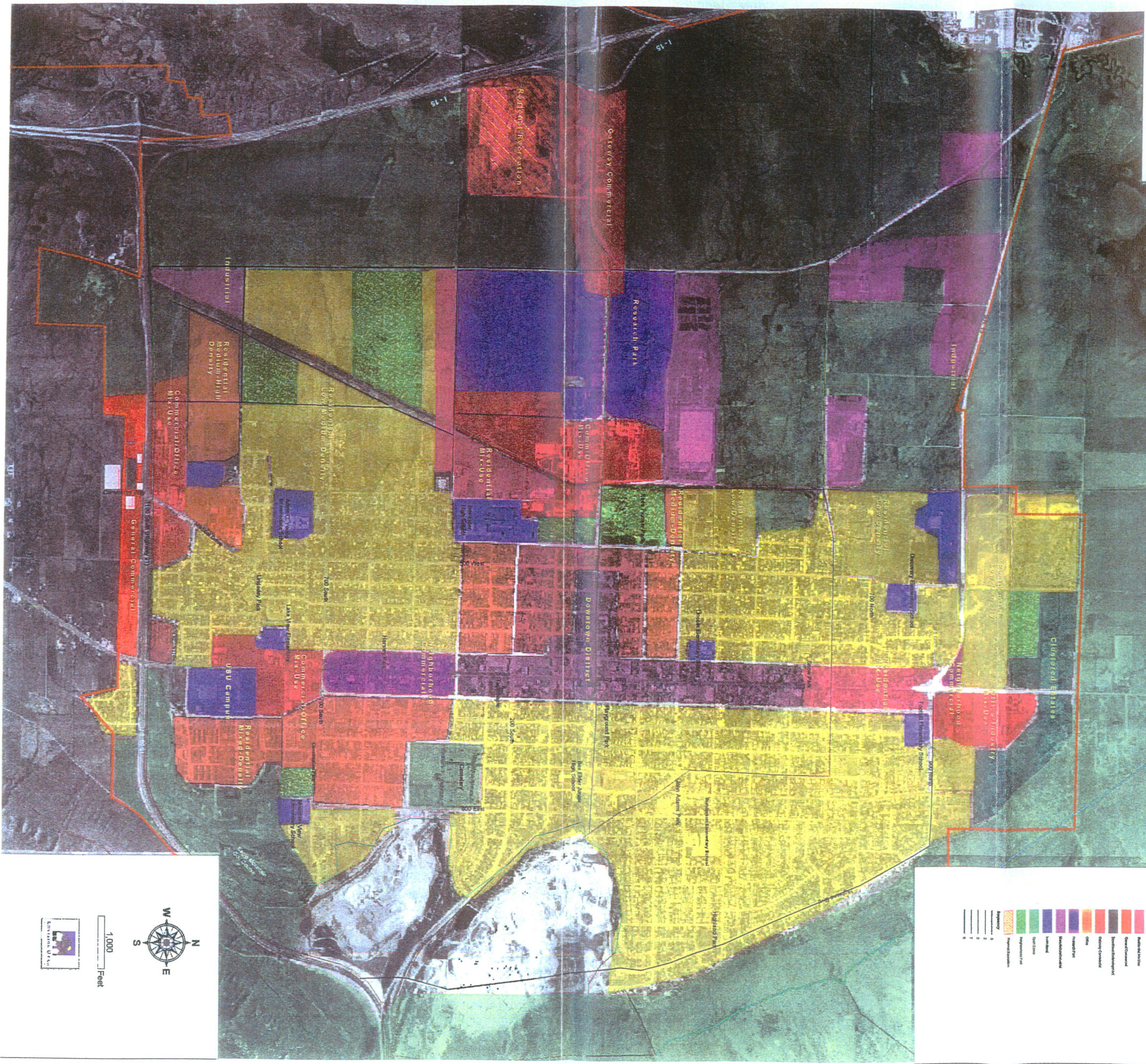
Some of the environmental concerns around the State are wetlands, endangered species, archeological sites, and geological sites among other issues. Environmental concerns should be addressed when looking at an area for any type of improvement to the transportation system. Specific issues mentioned in the Brigham City General Plan are hillside erosion, wetlands, and air quality. Protecting the environment is a critical part of the transportation planning process.

2.3. Socio-Economic (Census Brief: Cities and Counties of Utah, May 2001)

Brigham City ranks 29th for population in the State of Utah, out of 235 incorporated cities and towns. Historical growth rates have been identified for this study, because past growth is usually a good indicator of what might occur in the future. Figure 4 identifies the population growth over the past 50 years for the State of Utah, Box Elder County and Brigham. Figure 5 identifies that population change in Brigham City has ranged from 72.72% between 1950 and 1970 to gaining 0.31% between 1980 and 1990, while growth in the State has gained between 18 and 38 percent during the past 50 years.



Land-Use Plan
DRAFT



- Legend**
- Scale**
- 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
- Land Use**
- Residential Single-Family

Residential Medium-Density

Residential High-Density

Commercial General

Commercial Office

Industrial

Recreational

Highway

School

Park

Library

Community Center

Health Center

Senior Center

Youth Center

Adult Center

Elder Center

Disability Center

Veterans Center

Police Station

Fire Station

Court House

City Hall

Public Works

Water Treatment Plant

Wastewater Treatment Plant

Landfill

Incinerator

Power Plant

Gas Plant

Nuclear Plant

Coal Plant

Oil Plant

Solar Plant

Wind Plant

Geothermal Plant

Hydroelectric Plant

Biomass Plant

Nuclear Waste

Coal Waste

Oil Waste

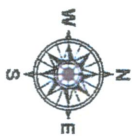
Solar Waste

Wind Waste

Geothermal Waste

Hydroelectric Waste

Biomass Waste

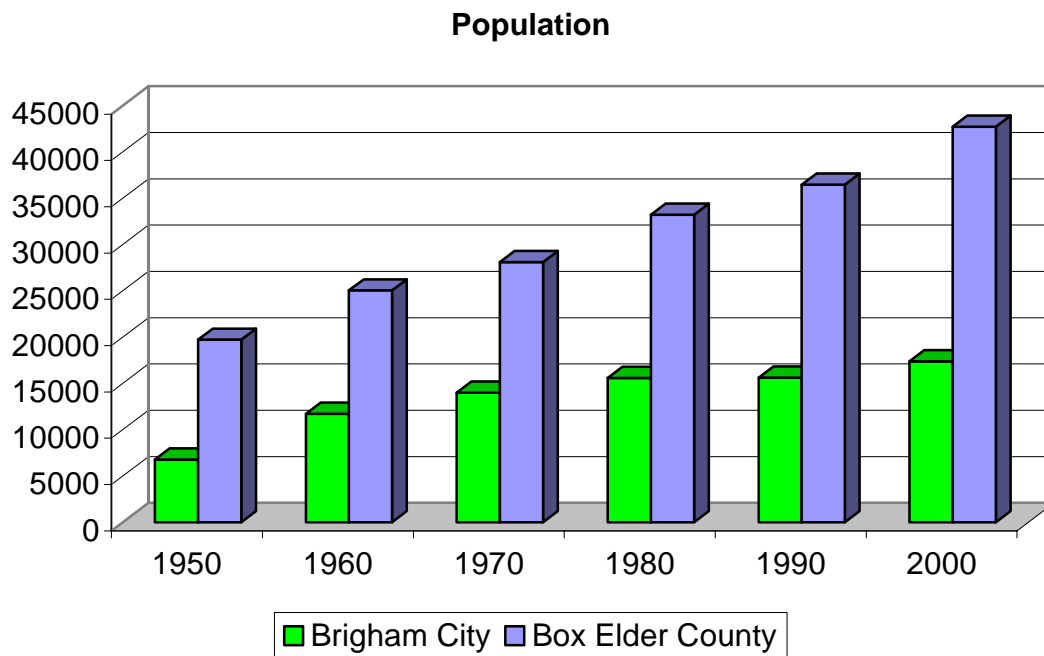


1,000 Feet



Figure 4. Population Data

Year	Population		
	Utah	Box Elder County	Brigham City
1950	688,862	19,734	6,790
1960	890,627	25,061	11,728
1970	1,059,273	28,129	14,007
1980	1,461,037	33,222	15,596
1990	1,722,850	36,485	15,644
2000	2,233,169	42,745	17,411



Source: U.S. Bureau of the Census

<http://www.governor.utah.gov/dea/OtherPublications.html>

Figure 6 identifies yearly population growth rates for the State of Utah and Box Elder County.

Though the State population has grown every decade from 1950 until 2000, Box Elder County has also showed a slower, yet consistent, rate of growth in population over the same period.

Brigham City has some unique demographic characteristics when compared with the State, particularly with age demographics. In the 25 to 54-age category, the State is at 38.6% the County is at 35.7% and the City is at 35.2%. For the 65+-age category, the State is at 8.5%, the County is at 10.4% and the City is at 12.1%. The State's median age is 27.1 years and the County's median age is 28.0 years, City's median age is 28.8 years. Another interesting statistic is that of Veteran status with State at 10.7%, County at 11.4%, and Brigham City at 12.3%.

The 2000 median household income in Brigham City is \$42,335, compared to the State median household income of \$45,726.

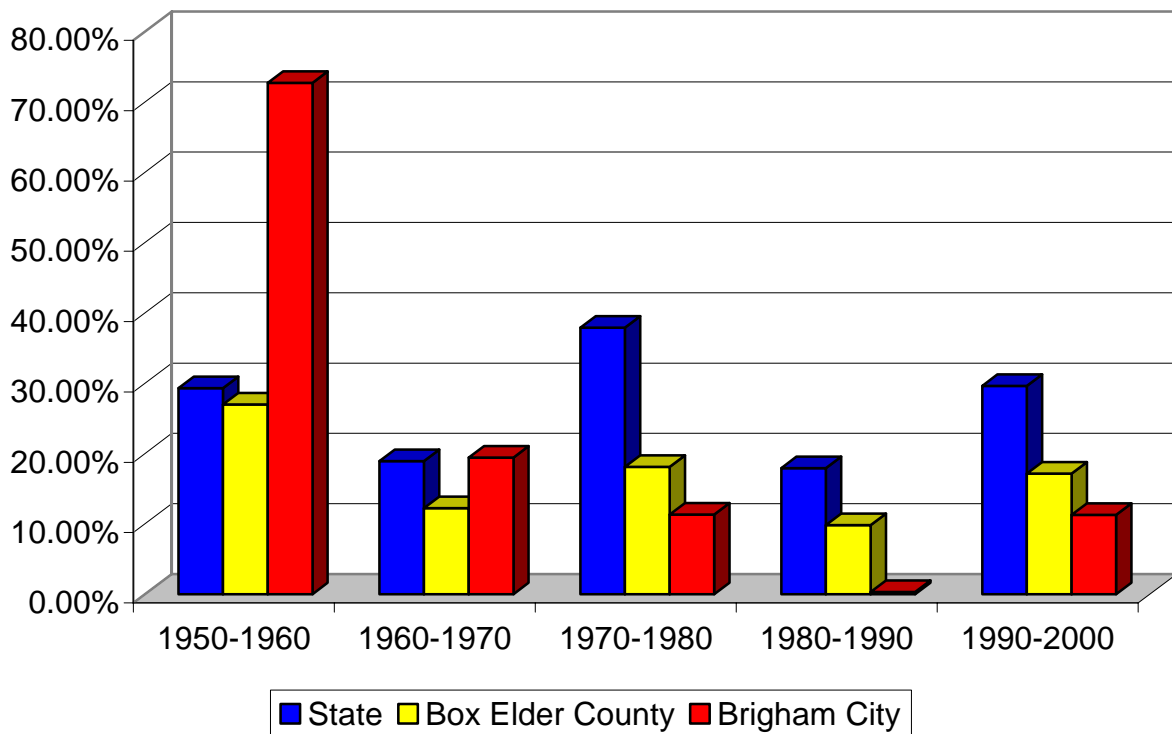
The unemployment rate in Brigham City was 4.3 percent in 2000. Due to Brigham City's large reliance on manufacturing jobs, the city has had larger rates of unemployment especially throughout the 90's, slightly greater than that of the State. According to the Utah Department of Employment Security (UDES), in 2000 there were approximately 7,186 employed people in Brigham City or 58.6% of the population. The city has 528 unemployed people, which is 4.3% of the population. There are 18,298 employed people in Box Elder County or 62.5% percent of the population. The county has 1,013 people unemployed, which is 3.5% of the population.

The majority of employees in Box Elder County work in three primary employment sectors: Manufacturing, Trade and Government as shown in Figure 8. In the county, these sectors make up 58.61% of the labor force. Another interesting note was that housing built from 1990-2000 were 18.1% of total for Brigham City compared to 25% for the state. Also homes built before 1939 were 19.0% of the total for Brigham City with 10% for the state.

Figure 5. Population Change Data

Decade	State of Utah	Box Elder County	Brigham City
1950-1960	29.29%	26.99%	72.72%
1960-1970	18.94%	12.24%	19.43%
1970-1980	37.93%	18.11%	11.34%
1980-1990	17.92%	9.82%	0.31%
1990-2000	29.62%	17.16%	11.30%

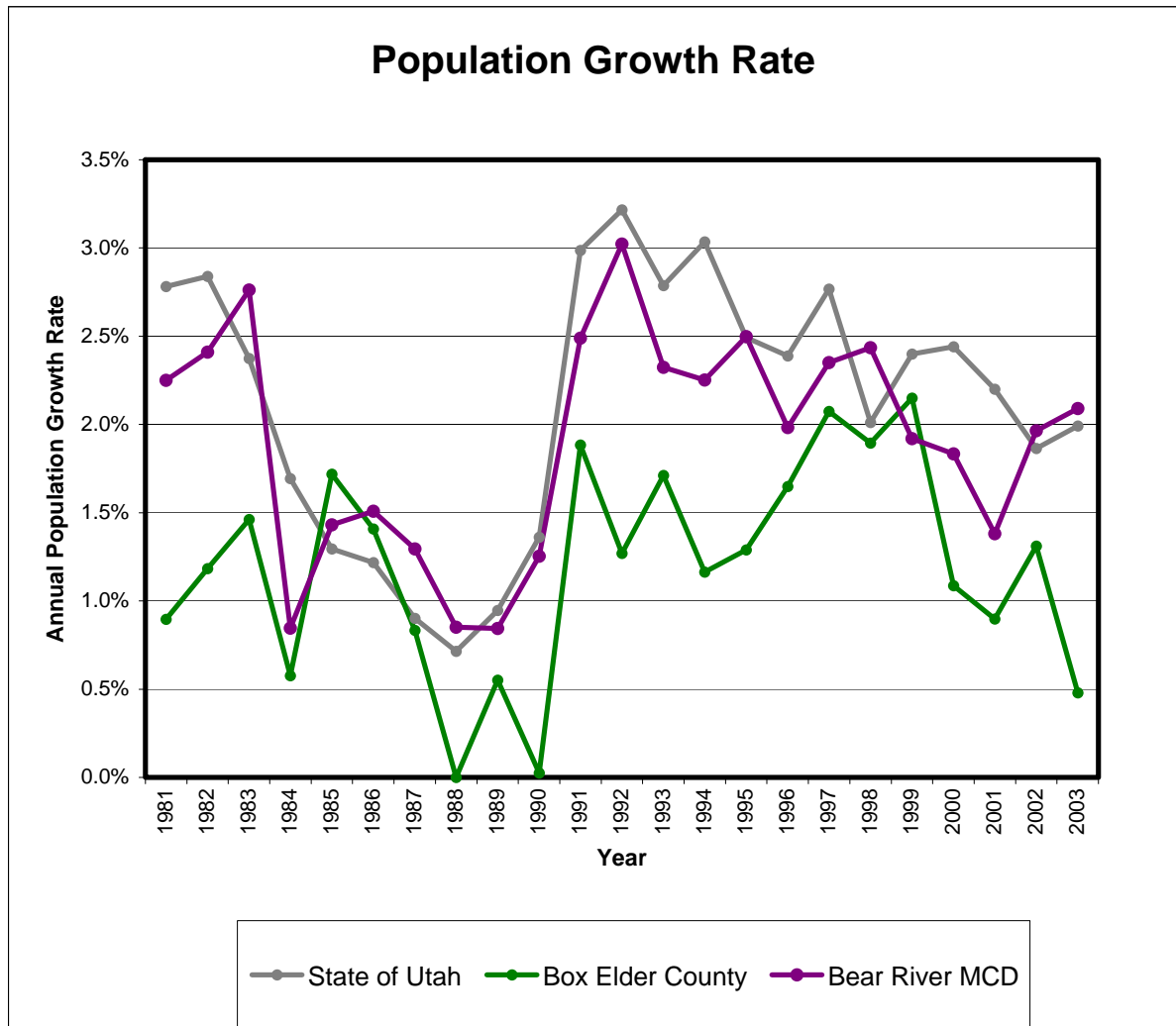
Decennial Population Change



Source Data: U.S. Bureau of the Census

<http://www.governor.utah./dea/OtherPublications.html>

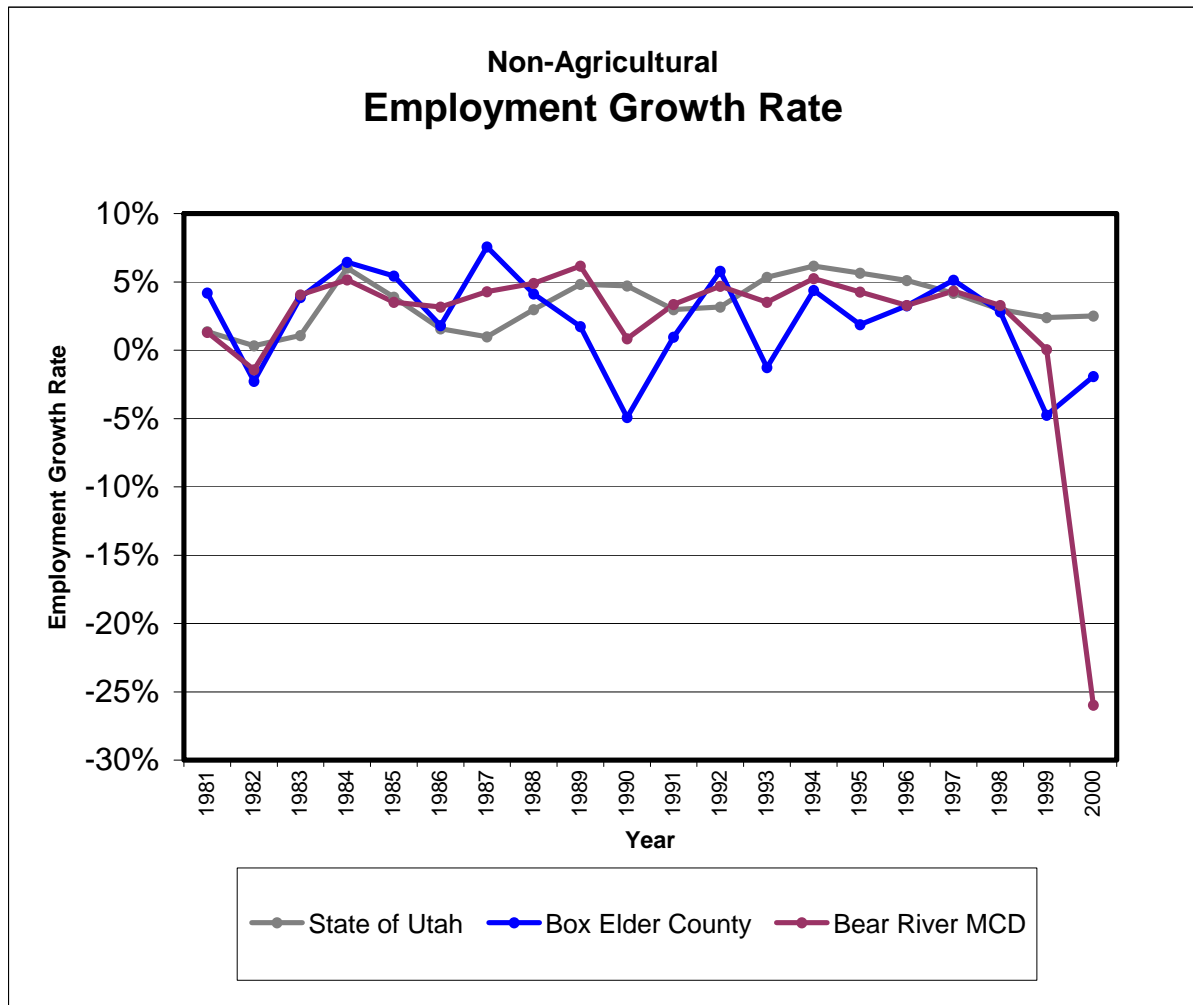
Figure 6. Population Growth Rate (1980-2000)



MCD = Multi-County Districts, Bear River MCD = Box Elder, Cache & Rich Counties

Source: Governors Office of Planning and Budget
<http://www.governor.utah.gov/dea>

Figure 7. Employment Growth Rate (1980-2000)



MCD = Multi-County Districts, Bear River MCD = Box Elder, Cache & Rich Counties

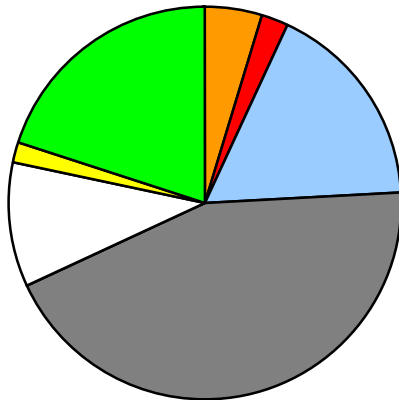
Source: Governors Office of Planning and Budget
<http://www.governor.utah.gov/dea>

Figure 8. Employment Sectors (1980-2000)

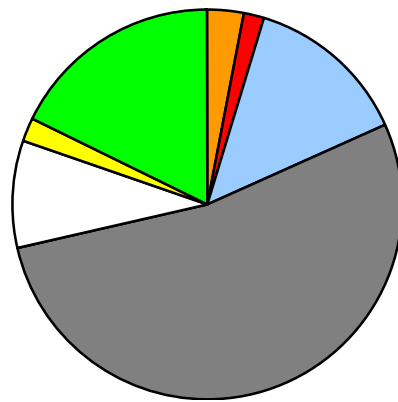
Sector	1980	1990	2000	Δ% 1980-2000
Construction	3.56%	2.37%	4.08%	79.52%
FIRE	1.71%	1.33%	1.60%	46.92%
Government	13.38%	10.70%	10.07%	17.86%
Manufacturing	33.75%	41.33%	32.79%	52.15%
Mining	0.05%	0.07%	0.13%	300.00%
Services	8.02%	6.98%	8.82%	72.09%
TCPU	1.28%	1.50%	1.83%	123.59%
Trade	15.39%	13.88%	15.75%	60.32%

FIRE = Finance, Insurance & Real Estate
 TCPU = Telecommunications & Public Utilities

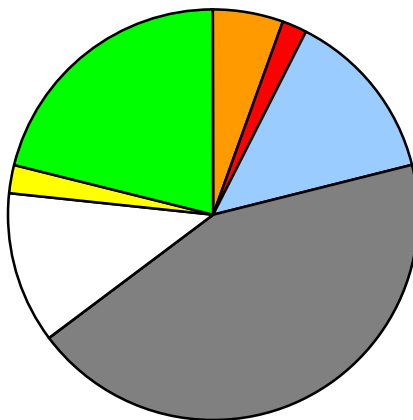
1980 Employment Sectors



1990 Employment Sectors



2000 Employment Sectors



Source: Governors Office of Planning and Budget
<http://www.governor.utah.gov/dea/HistoricalData.html>

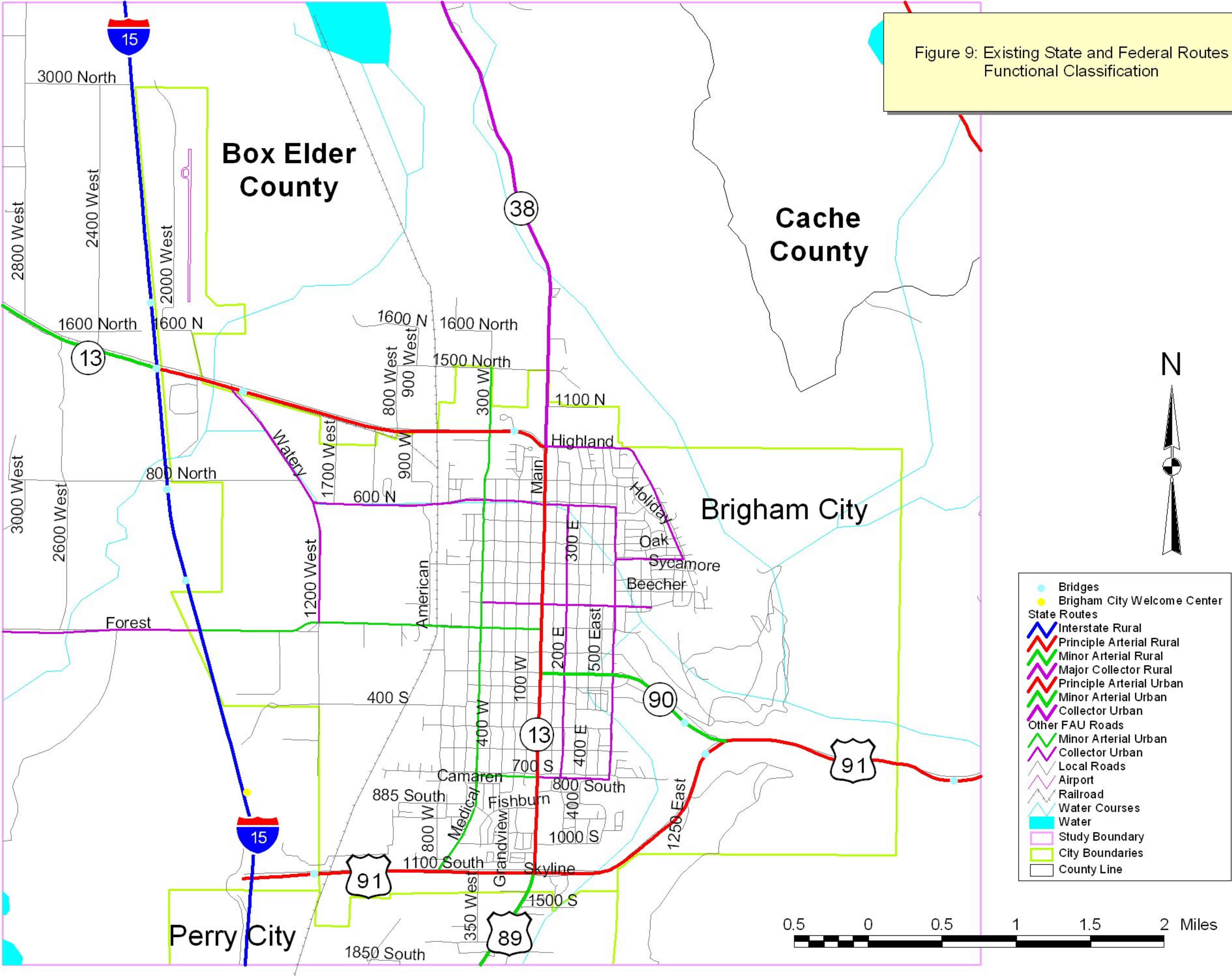
2.4. Functional Street Classification

This document identifies the current function and operational characteristics of the selected roadway network of Brigham City. Functional street classification is a subjective means to identify how a roadway functions and operates when a combination of the roadway's characteristics are evaluated. These characteristics include; roadway configuration, right-of-way, traffic volume, carrying capacity, property access, speed limit, roadway spacing, and length of trips using the roadway.

The primary classifications used in classifying selected roadways of Brigham City are: Interstate, Principle Arterial, Minor Arterial, Major Collector, Minor Collector and Local. An Arterial's function is to provide traffic mobility at higher speeds with limited property access. Traffic from the local roads is gathered by the Collector system, which provides a balance between mobility and property access trips. Local streets and roads serve property access based trips and these trips are generally shorter in length.

The Brigham City area is accessed by US-91 to I-15 as well as by SR-13. US-89 bisects the City North to South. SR-38 travels north out of the city, US-91 travels east toward the Logan Valley. SR-90 seems to be a connector route within the city limits. SR-13 travels west out of the City toward the Corinne community. The functionally classified system is currently being revised statewide. The current functionally classified system generally defines the higher traffic roads, so only minor additions or changes will be required.

Figure 9: Existing State and Federal Routes
Functional Classification



2.5 Bridges

There are twelve bridges on the state system located in the study area that could be eligible for federal bridge maintenance, rehabilitation, or replacement funds. Bridges are maintained and minor repairs made with maintenance funds. A bridge is rehabilitated or replaced as it deteriorates over time and as traffic volumes increase. (Figure 10 Bridge Sufficiency Rating)

Table 1 compares the bridges in the study area and identifies their sufficiency rating and location. Sufficiency rating indicates current condition of the structure with a rating of 100 showing a structure that is in excellent shape. A rating nearing 50 will

reveal a structure that is in need of attention and is eligible for federal funding.

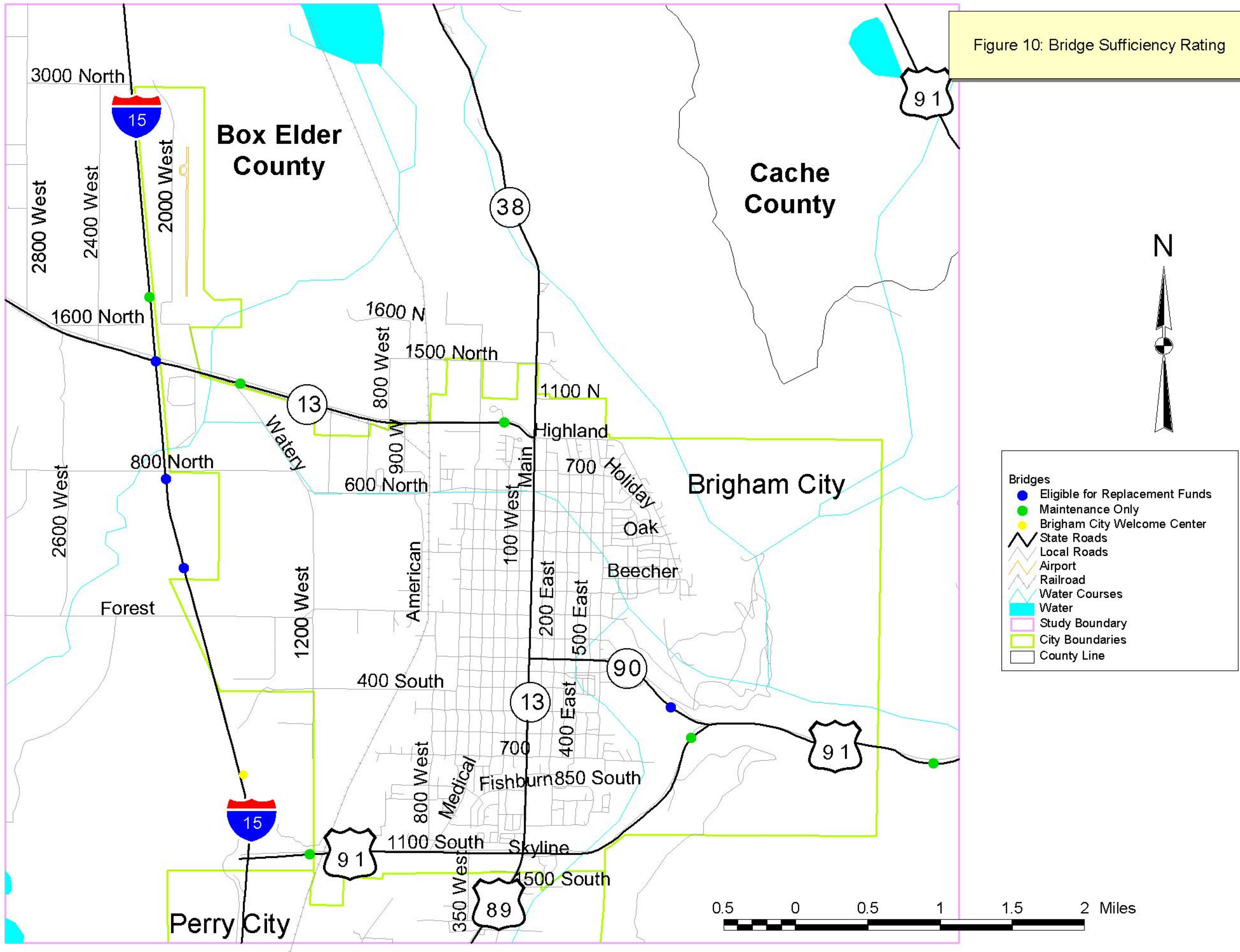


Half Interchange SR-90 & SR-91 in Box Elder Canyon

Table 1. Bridges

Number	Location	Maximum Span	No. Lanes & Road Width	Sidewalk	Sufficiency Rating
0F 599	SR-13	42.5M	2 lane/ 19.4 M	Yes	95.3
0D 383	CHASE SLOUGH (SR-13)	6.7 M	2 lane/ 11.6 M	No	82.4
1C 334(NBL)	SR-13 & UNION PACIFIC RR	71.9 M	2 lane/ 10.7M	No	77.3
3C 334 (SBL)	SR-13 & UNION PACIFIC RR	71.9 M	2 lane/ 14.3	No	77.3
0C 431	I-15 (SR-15) NBL & SBL	73.5 M	2 lane/ 11.0 M	Yes	51.0
0E1349	BLACK SLOUGH (I-15)	7.0 M	4 lane/ 22.2 M	No	70.2
0F 584	I-15 (SR-15) NBL & SBL	75.3 M	2 lane/ 18.7 M	No	99.8
1F 168	US-91 (SR-91) NBL & SBL	91.1 M	2 lane/ 8.5 M	No	49.8
1C 451(NBL)	UNION PACIFIC RAILROAD (US-91)	63.6 M	2 lane/ 10.7M	Yes	85.3
3C 451 (SBL)	UNION PACIFIC RAILROAD (US-91)	53.6M	2 lane/ 10.7M	Yes	86.3
0F 166	BOX ELDER CREEK (US-91)	9.6 M	5 lane/ 29.6 M	No	84.9
0F 578	TOWN ROAD,INTCHG.X-ROAD (US-91)	45.7 M	4 lane/ 24.8 M	No	83.9

Figure 10: Bridge Sufficiency Rating



Source: Utah Department of Transportation/Structures Division

2.6 Traffic Counts

Recent average daily traffic count data were obtained from UDOT. Table 2 shows the traffic count data on the key roadways of the study area. The number of vehicles in both directions that pass over a given segment of roadway in a 24-hour period is referred to as the average annual daily traffic (AADT) for that segment.

Table 2. Average Annual Daily Traffic

Road	Segment	Year	AADT
SR-13	Junction SR-90 in Brigham City	2002	15,965
SR-13	Junction SR-38 via Main Street Brigham City	2002	7,370
SR-13	Junction of I-15 North Brigham City	2002	5,585
I-15	US-91 to Forest Street Interchange	2002	32,046
I-15	Forest Street Interchange to SR-13	2002	27,971
I-15	North of SR-13	2002	25,174
SR-38	SR-13 to Brigham City Boundary	2002	3,736
SR-38	North of Brigham City Boundary	2002	2,750
US-89	North Incorporated Limits / SR-91 Brigham City	2002	12,995
US-90	Junction SR-13 Main Street	2002	8,875
US-90	Junction 600 East Street-SR-91 Brigham City	2002	4,725
SR-91	I-15 to Main Street/US-89	2002	18,000
SR-91	Main Street/US-89 to SR-90	2002	14,145

Source: Utah Department of Transportation

*INCL=Incorporated City Limits

These are averages for the entire year. Brigham City experiences a significant increase in traffic during the summer months. UDOT maintains 86 continuously operated automatic traffic recorders (ATR) throughout the state highway system. ATRs collect data continuously throughout the year in order to determine monthly, weekly, daily, and hourly traffic patterns. One ATR located in or near the study area on US-91. The following points summarize the 2003 data from the ATR at this location.

Traffic on US-91; 0.8 Miles North of SR-101, Wellsville @ MP 19.55

- August was the highest volume month.



SR-91 & Medical Way Intersection

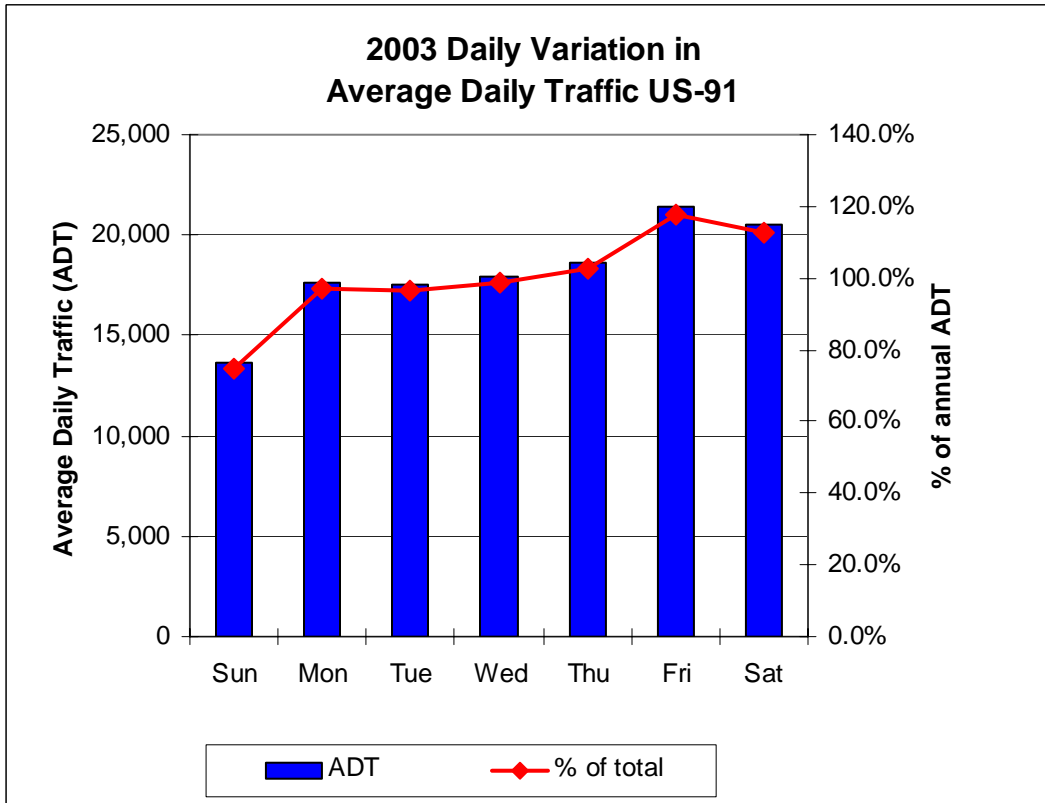
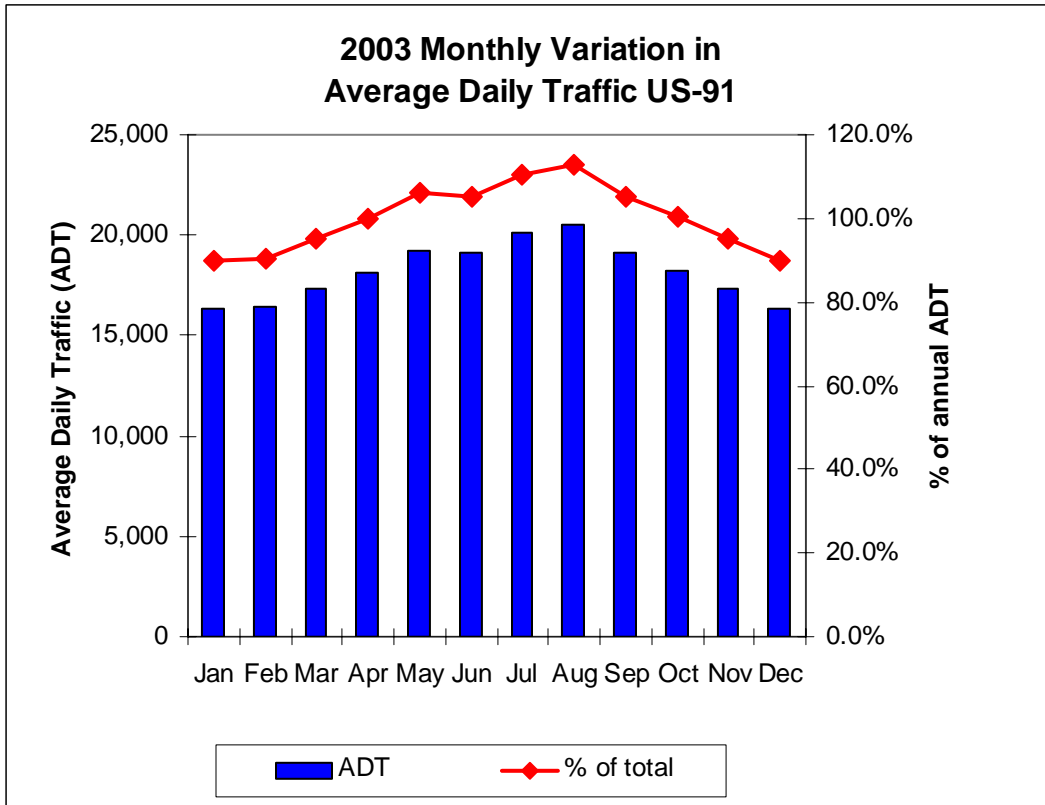
- December was the lowest volume month.
- The highest daily volumes occurred on Friday.
- The lowest daily volumes occurred on Sunday.

The peak months of May and August is consistent with a recreational usage as well as traffic traveling through the area on their way to Utah State University in Logan.

The hourly traffic shows a clear average peak hour of around 3:00 TO 5:00 pm. This is consistent with an afternoon commuter peak.

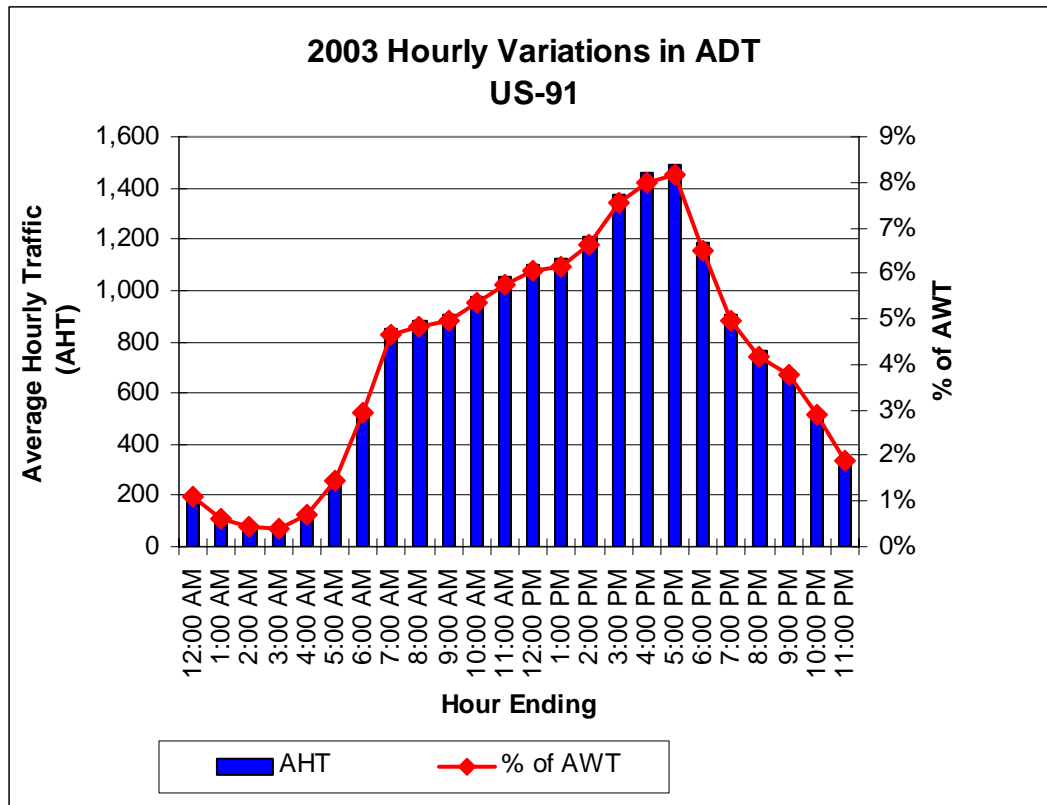
A map illustrating existing and future traffic, peak season traffic, and roadway capacities is presented in the Traffic Forecast section 3.2.

Figure 10 Monthly and Daily ADT on US-91



Source: Utah Department of Transportation

Figure 12 Hourly Variation on US-91



Source: Utah Department of Transportation

2.7 Traffic Accidents

Traffic accident data was obtained from UDOT's database of reported accidents from 2002. Table 3 summarizes the accident statistics for those segments for the year 2002. Additional information includes the average daily traffic, the number of reported accidents, and the accident rates. The roadway segment accident rates were determined in terms of accidents per million vehicle miles traveled. The crash rates for each roadway segment are compared to the expected crash rate for similar facilities across the state.

Upon review of the accident data for the state system, there appears to be a higher than expected accident rates at the following locations:

- On SR-13 From the Junction of SR-91 to Forest Street
- On SR-13 From Bear River to 3900 West
- On I-15 From Exit 360 Willard/Perry to Exit 364 Brigham
- On SR-38 North of Brigham City (3 Miles)
- On US-89 From 1850 South Perry to the Junction of US 91

The remainder of the state system shows a lower than expected accident rate. Figure 13 shows accident data taken from 1999-2001, which shows various segments of the state highway system and associated accident data.

Brigham City may wish to review the accident history for the local street system to identify any specific accident hot spot locations.

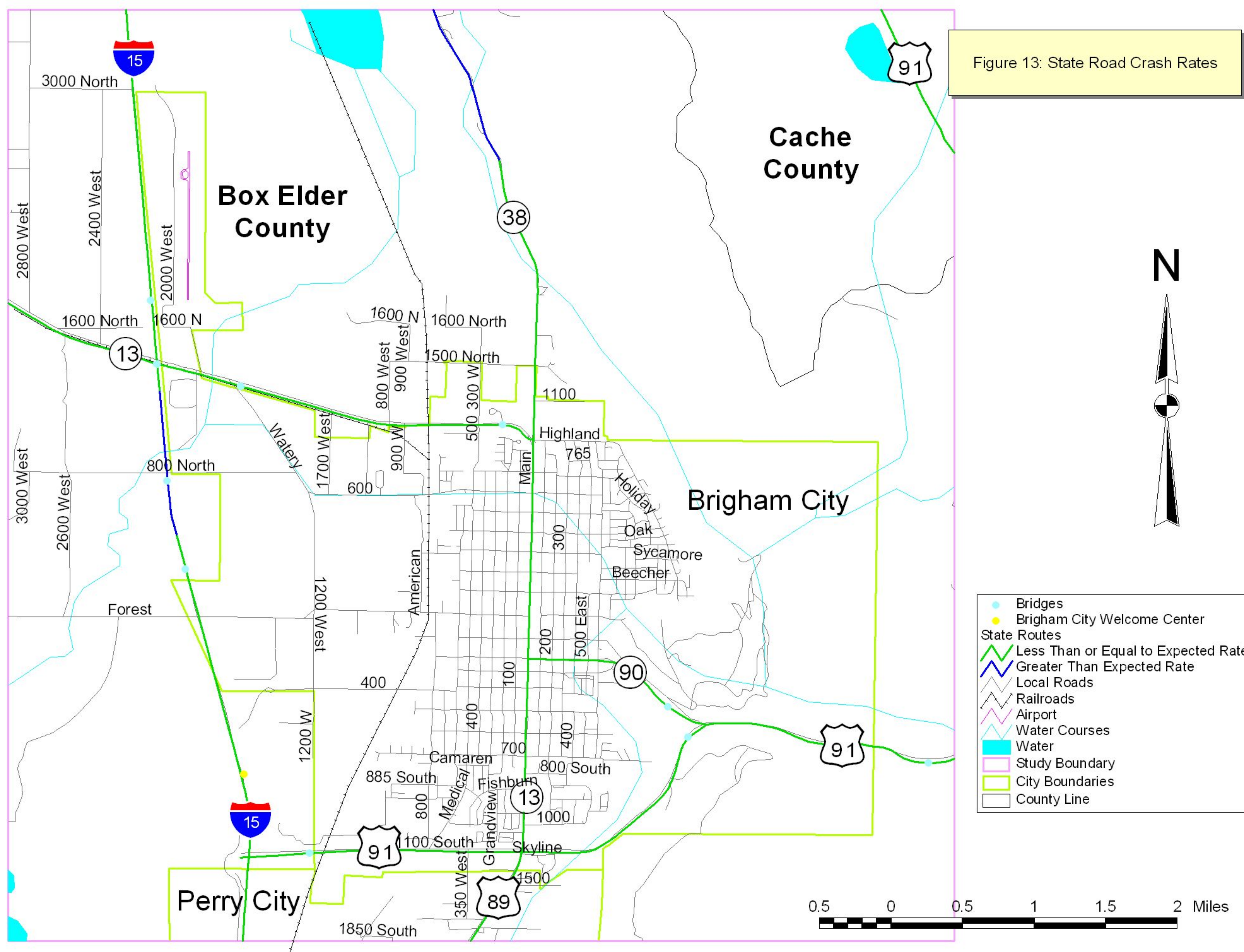
Table 3. Crash Data 2002

Road	From Milepost	End Milepost	ADT (2002)	# Crashes (2002)	Crash Rate	
					Actual	Expected*
SR-13	0	1.64	15,965	52	4.24	2.58
SR-13	1.65	2.87	15,585	11	1.21	2.58
SR-13	2.88	3.63	7,370	3	2.18	3.01
SR-13	3.64	5.58	5,070	3	0.90	4.11
SR-13	5.59	7.26	5,585	3	0.59	1.98
SR-13	7.27	8	6,785	4	2.34	1.98
I-15	358	362.39	44,510	25	0.38	1.15
I-15	362.4	364.12	32,046	6	0.32	1.00
I-15	364.13	365.91	27,971	17	1.01	0.89
I-15	365.92	370	25,174	14	0.40	0.89
SR-38	0	0.28	3,736	0	0.00	4.87
SR-38	0.29	1.03	2,735	1	0.86	4.87
SR-38	1.04	4	2,750	12	2.57	2.28
US-89	373	374.62	12,385	45	6.50	3.01
SR-90	0	0.48	8,875	1	0.63	4.02
SR-90	0.49	1.61	4,725	1	0.63	6.43
US-91	0	1.35	18,000	7	0.85	3.80
US-91	1.36	1.96	20,315	5	1.45	3.80
US-91	1.97	3.82	14,145	8	0.87	5.16
US-91	3.83	5	17,085	10	1.27	3.80

* Statewide average accident rates for functional class and volume group.

Red indicates higher than expected rates of accidents

Figure 13: State Road Crash Rates



2.8 Bicycle and Pedestrian

The Federal Highway Administration recognizes the increasingly important role of bicycling and walking in creating a balanced, intermodal transportation system, and encourages state and local governments to incorporate all necessary provisions to accommodate bicycle and pedestrian traffic. In following this directive, Brigham City is encouraged to adopt a “complete the street” philosophy that allows for the advancement of a transportation system for both motorized and non-motorized travel.

Brigham City appears to support alternative transportation modes, as noted in Chapter 7 of the City’s General Plan that states “although vehicular movement is an important element of the overall transportation equation, other modes of transportation need to be given consideration in planning if a desirable outcome is to be achieved.” The City is encouraged to include alternative modes of transportation in all planning decisions.

2.8.1 Biking/Trails

Brigham City acknowledges that within the community bicycles are used for recreation as well as commuting. This acknowledgement is documented in the General Plan as the need to provide “a well-defined, fine-grained street or trail network that allows bicycles to operate as an effective alternative to automobiles”.

The City currently does not have designated bike lanes on local roads. However, reference is made to the fact that certain streets may lend themselves to being identified as a designated bike route. In order to move this designation plan forward, the City has documented the need to prepare a detailed bicycle plan.

There are four popular trails identified in the Brigham City area, ranging in difficulty from beginner to advanced. These trails are known as:

- Inspiration Point – A 32 mile roundtrip trail located in the Wasatch Mountains southeast of Brigham City. Technical difficulty rating: Advanced
- Golden Spike, West Grade Tour – A 14 mile loop located at the Golden Spike National Historic Site. Technical difficulty rating: Moderate
- Golden Spike, East Grade Tour – A 3.5 mile loop located at the Golden Spike National Historic Site. Technical difficulty rating: Beginner
- Little Pyrenees – This 24 mile trail travels through the rolling hills of the south Cache Valley, past the Wellsville Mountains and along the marshes surrounding the Little Bear River. Technical difficulty rating: Beginner

Additionally, the Governor’s Legacy Trails Initiative as described in the State’s Long Range Plan, identifies a network of trails that when completed, would ensure access to trails/paths within 15 minutes of home and work for all Utahans. One of these Legacy Trails is the Cold Water Canyon; a four-mile, unpaved trail located in the Brigham City area.

2.8.2 Pedestrian

Brigham City's street design consists of a strong grid network and a development pattern of short blocks and sidewalk that facilitates pedestrian traffic. This street pattern has made walking an attractive option for those in the community. However, some of the more recent developments constructed in the City have tended toward longer uninterrupted streets, less interconnectedness in the street network, and fewer sidewalks. This is particularly noticeable in the northeast quadrant of the City where sidewalks have not been installed and pedestrian safety is a concern.

The City recommends placement of a park strip to separate sidewalks from traffic lanes. This strategy provides an increased feeling of security for pedestrians and provides aesthetic appeal, while also servicing the need for snow storage.

2.9 Public Transportation

Brigham City does not have an intracity bus transit system. However, the Utah Transit Authority does operate two bus routes primarily for commuters, which link Brigham City with Ogden. Route #630 runs down Main Street in Brigham stopping at the city offices, library, and hospital before heading south to Ogden where it terminates at the downtown Ogden transit center. Route #685 is operated from Brigham City to Harrison Avenue on Ogden's east side primarily for the benefit of Flying J Oil employees. Flying J's corporate headquarters relocated from Brigham City to Ogden several years ago and many of their employees still live in Brigham City.

Brigham City currently has a Focus Group investigating future transit needs and operations within the community, and how the city will connect with the proposed commuter rail system to be built north from Salt Lake City. Phase One of commuter rail should be in operation between Salt Lake City, Ogden, and Pleasant View by early 2008. While the extension of service north to Brigham City is not included in the first phase of commuter rail construction, this could change should additional tax revenue be obtained from the community in support of this project.

Greyhound Lines no longer provides intercity bus service to Brigham City even though several of their long-distance routes pass through the city each day. The nearest Greyhound stops are found in Logan and Ogden.

Intercity rail passenger service ended to Brigham City in April of 1981, though Amtrak's "Pioneer" continued to stop in Ogden on its route from Salt Lake City to Seattle until it was discontinued in May of 1997. Today the nearest Amtrak stop to Brigham City is in Salt Lake City where the Chicago to San Francisco "California Zephyr" stops nightly in both directions.

Airline service is not provided at either Brigham City or Ogden, with the nearest scheduled airlines operating out of the Salt Lake City International Airport.

2.10 Freight

Brigham City is served by several important highway freight routes, and as such is a key junction point for the trucking industry. Interstate Highways 15 and 84 are combined as they pass around the west side of Brigham City on a north/south alignment. I-15 is the primary north/south highway freight route through the Mountain West as well as serving as the main Canamex Corridor route for traffic to and from Mexico and Canada generated as a result of the North American Free Trade Agreement (NAFTA) Treaty. I-84 is the main highway link between the Pacific Northwest and the Midwestern and Eastern United States handling east/west truck traffic. U.S. Highways 89 and 91 are combined as they enter Brigham City from the Cache Valley and points north, with the roads splitting at the south end of town. U.S. 89 travels south along the Wasatch Mountains, while U.S. 91 continues west to combine with I-15/84 as far south as Ogden.



Union Pacific Rail Road Crossing at
Forest Street

In addition to considerable amounts of long-distance truck traffic on these main highway freight routes, industries in the Brigham City area generate substantial inbound and outbound truck traffic.

Although not located in Brigham City proper, the large Wal-Mart Distribution Center in nearby Corinne, Utah, averages 150 inbound trucks and 125 outbound trucks each day. A lack of truck parking in the area has created a congestion and safety issue as inbound trucks arrive in the Brigham City/Corinne area in the late night/early morning hours and must wait for the Wal-Mart facility to open each morning.

Autoliv Corporation, located on the west side of downtown Brigham City on 1200 West generates an average of 25 inbound and 19 outbound trucks each day. Nucor Steel's subsidiaries Nucor Cold Finish and Vulcraft, both located on State Route 13 adjacent to I-15/84 generate an average of 18 outbound trucks each day with most inbound shipments being handled by rail.

On Brigham City's east side, up against the Wellsville Mountains, the Staker Parson Gravel Pit averages upwards of 200 trucks per day during the busy summer construction season, with that number dropping to about 50 trucks each day during mid-winter. The nearby Fife Rock Products gravel pit sees an average of 50 trucks per day in summer with as little as one to five in winter.

Other truck freight producing industries in Brigham City include Southern Post on 600 North and the Big J Grain Mill on Forest Street. Each of these industries is a vital part of the economy of Brigham City.

Among the challenges facing the trucking industry in the Brigham City area is the lack of access to U.S. 89/91 southbound from S.R. 90 eastbound at the mouth of Sardine Canyon on the east side of town. Also, legal issues associated with truck traffic using U.S. 89 through nearby Willard are having a major impact on the sand & gravel industry in Brigham City.

On May 10, 1869, the famous Golden Spike was driven at Promontory, Utah, less than 30 miles northwest of Brigham City marking the completion of America's first transcontinental railroad. Since that time, railroad freight service has been an important factor in the local economy. Although the transcontinental mainline was relocated to the historic Lucin Cutoff causeway across the Great Salt Lake west of Ogden in 1904, Brigham City has continued to be served by the Union Pacific Railroad.



Intersection of SR-91 & SR-13

Brigham City is the junction point between UP's secondary mainline from Ogden north to Pocatello, Idaho, and the Malad Branch running northwest from Brigham to Malad, Idaho via Corinne, Tremonton, and Plymouth, Utah. Several switching tracks are maintained by UP along the north/south mainline between the Malad Branch junction and the Forest Street crossing on the west side of downtown. Inasmuch as Forest Street is now one of three access points to and from I-15/84, railroad switching movements at the small Brigham City freight yard are having a greater impact on highway traffic.

Train operations in Brigham City consist of the "Malad Local," which operates daily except Saturdays between Brigham City and the main Nucor Steel mill at Plymouth, Utah. The Malad Local operates on an as needed basis to serve shippers along the line between Plymouth and Malad, Idaho. However, with the recent addition of new rail shippers in Malad, this train will soon be running all the way to the end of the line three days per week, resulting in additional cars to be switched at the downtown Brigham City freight yard.

Freight cars traveling to and from either Brigham City's own industries, or those served by the Malad Local, arrive and depart from Brigham City's downtown freight yard via the "Brigham-Little Mountain Local." This train originates in Brigham City every day except Saturdays and taking outbound cars south to UP's Ogden/Riverdale Yard, returning with inbound cars for local delivery or transfer to the Malad Local. There are two to three mainline freight trains that pass through Brigham City every day in each direction. Normally these trains do not stop to switch cars in Brigham City as the transfer of cars traveling to and

from Brigham City is handled at the Ogden/Riverdale Yard via the Brigham-Little Mountain Local.

The last train to work in Brigham City is called the “Brigham Switcher,” which does local switching in the small yard near downtown putting together the outbound trains to Malad and Ogden. The Brigham Switcher goes on duty at 7:00 AM every day except Sunday, with the Brigham-Little Mountain Local going on duty at 8:00 AM. It is these two trains that create the bulk of the traffic delays at the Forest Street crossing. The Malad Local goes on duty at 2:00 PM in the afternoon.

The Union Pacific is well aware of the traffic impact issues at Forest Street, with current Manager of Train Operations (MTO) in Ogden, as well as the local train crews, striving to minimize blockage of that important crossing. Brigham City and the Union Pacific should work together to consider what options are viable for addressing this issue.

The largest rail shipper in the Brigham City area is Nucor Steel, with Nucor Cold Finish receiving about 50,000 tons of finished steel each year by rail, while Vulcraft next door receives more than 100,000 tons of steel annually. Almost all of these rail shipments come from the main Nucor Steel Mill in Plymouth, Utah via the Malad Branch, on which both of these subsidiary companies are located near the Brigham City airport. As such, the cars traveling to and from Plymouth and the Vulcraft/Nucor Cold Finish plants are not switched at the aforementioned downtown freight yard. UP averages two to three mainline freight trains in each direction daily through Brigham City, which provide a link for local industries to the rest of the nation via the main freight switching yards in Salt Lake City, Ogden, Pocatello, and at Hinkle, Oregon, near Hermiston in the northeast part of the state.

At present, air cargo has a minor presence at the Brigham City Airport, consisting primarily of small, executive-type business jets flying in automobile airbag components from the eastern United States for Autoliv Corporation. The planned extension and strengthening of the runway at the Brigham City Airport would allow larger cargo jets to begin serving local industries, which is discussed further in the following section.

2.11 Aviation Facilities & Operations

At an elevation of 4226 feet above sea level, the Brigham City Airport is located three miles northwest of downtown Brigham City on State Route 13 next to the interchange with I-15/84. The airport is equipped with a single north/south runway #16/34, with a length of 7500 feet and a width of 100 feet. Paved with asphalt, runway 16/34 is equipped with pilot-activated runway lights while the airports airway beacon light is illuminated from dawn to dusk. While there is no control tower at Brigham City Airport, UNICOM and AWOS are available for pilots, as is a Non-directional electronic navigation beacon.

As the only airport in Box Elder County and one which serves a large area of northern Utah and southern Idaho, Brigham City has four Fixed-Base Operators (FBO), Airmotive Service, Mountain Air, The Flight Shop, and D & D Aircraft to handle aircraft fueling and maintenance needs. Both 100 octane aviation gasoline and Jet A fuel are available for general aviation and corporate business jet operations.

There is no commercial airline serving Brigham City with Salt Lake City International providing the nearest airline service. Air Cargo service into Brigham City is currently provided by charter carriers flying in automobile airbag components from the eastern United States to the Autoliv plant near downtown. Autoliv hopes that the proposed lengthening of runway 16/34 will allow larger DC-9 cargo jets to take over this operation, which is currently equipped with smaller, less efficient Lear and Falcon business-type aircraft.

Future plans for the Brigham City Airport include the proposed lengthening of runway 16/34 an additional 1400 feet at the north end to a total length of 8900 ft. This combined with widening the safety area paralleling the runway from 150 feet to 300 feet, along with increasing the runway's pavement thickness will allow larger corporate and cargo jet aircraft to operate to their full design capacity year-round into Brigham City. Additionally, the city is investigating the installation of a full Instrument Landing System (ILS) to replace the current GPS non-precision approach system to better accommodate those larger and faster jet aircraft. A paved parallel taxiway and additional parking ramp space are also being considered for the Brigham City Airport. Finally, as a highway safety issue, the entrance to the airport is to be relocated approx. 800 feet to the west of its current location on S.R. 13.

2.12 Revenue

Maintenance of existing transportation facilities and construction of new facilities come primarily from revenue sources that include the Brigham City general fund, federal funds and State Class C funds.

Financing for local transportation projects consists of a combination of federal, state, and local revenues. However, this total is not entirely available for transportation improvement projects, since annual operating and maintenance costs must be deducted from the total revenue. In addition, the City is limited in their ability to subsidize the transportation budget from general fund revenues.

2.12.1 State Class B and C Program

The distribution of Class B and C Program monies is established by state legislation and is administered by the State Department of Transportation. Revenues for the program are derived from State fuel taxes, registration fees, driver license fees, inspection fees, and transportation permits. Twenty-five percent of the funds derived from the taxes and fees are distributed to cities and counties for construction and maintenance programs.

Class B and C funds are allocated to each city and county by the following formula: 50% based on the population ratio of the local jurisdiction with the population of the State, 50% based on the ratio that the Class B roads weighted mileage within each county and the class C roads weighted mileage within each municipality bear to the total class B and Class C roads weighted mileage within the state. Weighted means the sum of the following: (i) paved roads multiplied by five; (ii) graveled road miles multiplied by two; and (iii) all other road types multiplied by one. (Utah Code 72-2-108) For more information go to UDOT's homepage @ www.udot.utah.gov, tab on "Doing Business" select the tab for "Local Government Assistance" here you will find the Regulations governing Class B&C funds

The table below identifies the ratio used to determine the amount of B and C funds allocated.

Apportionment Method of Class B and C Funds

Based on	Of
50%	Roadway Mileage *Based on Surface Type Classification (Weighted Measure) Pave Road (X 5) Graveled Road (X 2) Other Road (X 1)
50%	Total Population

Class B and C funds can be used for maintenance and construction of highways, however thirty percent of the funds must be used for construction or maintenance projects that exceed \$40,000. Class B and C funds can also be used for matching federal funds or to pay the principal, interest, premiums, and reserves for issued bonds.

Brigham City received \$669,176.92 in 2003 for its Class C fund allocation.

2.12.2 Federal Funds

There are federal monies that are available to cities and counties through federal-aid program. The funds are administered by the Utah Department of Transportation. In order to be eligible, a project must be listed on the five-year Statewide Transportation Improvement Program (STIP).

The Surface Transportation Program (STP) provides funding for any road that is functionally classified as a collector street or higher. STP funds can be used for a range of projects including rehabilitation and new construction. The Joint Highway Committee programs a portion of the STP funds for projects around the State for urban areas. A portion of the STP funds can be used in any area of the State, at the discretion of the State Transportation Commission.

Transportation Enhancement funds are allocated based on a competitive application process. The Transportation Enhancement Advisory Committee reviews the applications and then a portion of those are recommended to the State Transportation Commission for funding. Transportation enhancements include 12 categories ranging from historic preservation, bicycle and pedestrian facilities to water runoff mitigation. Other funds that are available are State Trails Funds, administered by the Division of Wildlife Resources.

The amount of money available for projects specifically in the study area varies each year depending on the planned projects in UDOT's Region One. As a result, federal aid program monies are not listed as part of the study area's transportation revenue.

2.12.3 Local Funds

Brigham City, like most cities, has utilized general fund revenues in its transportation program. Other options available to improve the City's transportation facilities could involve some type of bonding arrangement, either through the creation of a redevelopment district or a special improvement district. These districts are organized for the purpose of funding a single, specific project that benefits and identifiable group of properties. Another source is through general obligation bonding arrangements for projects felt to be beneficial to the entire entity issuing the bonds.

2.12.4 Private Sources

Private interests often provide alternative funding for transportation improvements. Developers construct the local streets within the subdivisions and often dedicate right-of-way and participate in the construction of collector or arterial streets adjacent to their developments. Developers can be considered as an alternative source of funds for projects because of the impacts of the development, such as the need for traffic signals or street widening. Developers should be expected to mitigate certain impacts resulting from their developments. The need for improvements, such as traffic signals or street widening can be mitigated through direct construction or impact fees.

3. Future Conditions

3.1. Land Use and Growth

Brigham City's Transportation Master Plan must be responsive to current and future needs of the area. The area's growth must be estimated and incorporated into the evaluation and analysis of future transportation needs. This is done by:

- Forecasting future population, employment, and land use;
- Projecting traffic demand;
- Forecasting roadway travel volumes;
- Evaluating transportation system impacts;
- Documenting transportation system needs; and
- Identifying improvements to meet those needs.

This chapter summarizes the population, employment, and land use projections developed for the project study area. Future traffic volumes for the major roadway segments are based on projections utilizing 20 years of traffic count history. The forecasted traffic data are then used to identify future deficiencies in the transportation system.

3.1.1 Population and Employment Forecasts

The Governor's Office of Planning and Budget develop population and employment projections. The current population and employment levels, as well as the future projections for each are shown for Brigham and Box Elder County in the following table.

Population and Employment

Year	City	County	
	Population	Population	Employment
2000	17,411	42,745	19,311
2030	24,509	70,755	29,685

3.1.2 Future Land Use

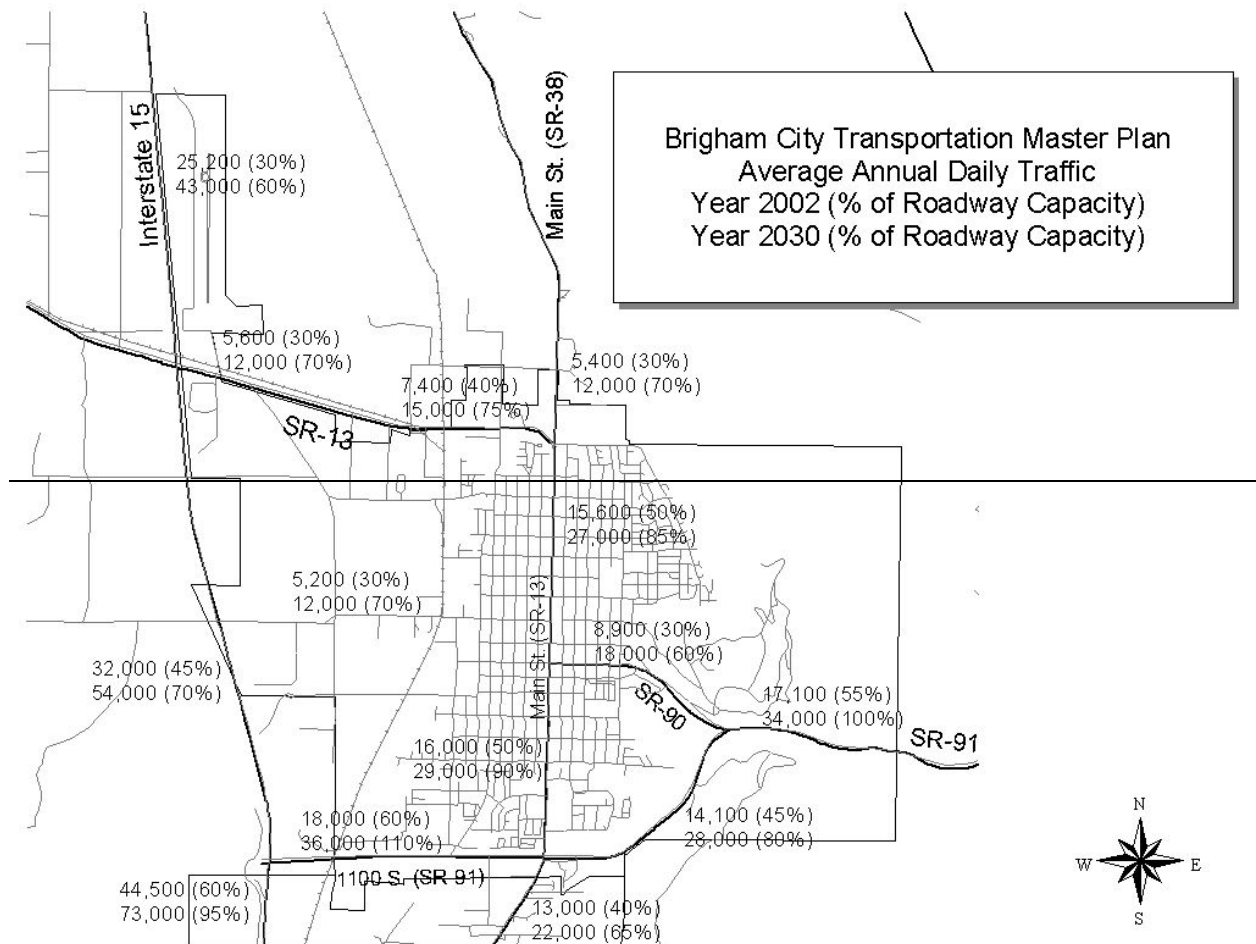
The City has an annexation plan that describes where it plans to grow. Some areas for developments were discussed during the course of the Transportation Master Plan. Updated Land Use documents can be found in the Brigham City General Plan.

While specific development plans change with time, it is important to note possible areas of development within the Brigham area. Commercial and industrial growth is also important in understanding transportation needs.

3.2 Traffic Forecast

Traffic in the Brigham area is growing and will continue to grow. Although the population projections from the Governors Office of Planning and Budget show a 1.6% annual growth,

traffic has historically grown at about 2% to 4%. It is estimated that traffic volumes on downtown Main Street will grow about 2.5% per year. On the fringes of town like SR 91 east of I-15, the potential for growth is greater so a 3.5% growth rate was assumed. The map on the following page shows average annual daily traffic for years 2002 and 2030. Also shown is the percentage of the roadway capacity the traffic will reach. The map illustrates that a few corridors could have capacity issues by the year 2030 if historical trends continue.



4 Transportation Improvement Projects

4.1 Current Statewide Transportation Improvement Program (STIP)

At the present time there are several projects under consideration and investigation in the Brigham City area. Currently in the STIP are the following Projects:

- SR-13; Brigham City Main (1100 South to SR-38)
- SR-13; Brigham City to I-15
- Interchange; SR-91 & 1100 South
- Watery Lane; SR-13 to 900 North, Phase II
- Asphalt Pavement Rehabilitation I-15; Brigham City to Corinne

Also, these projects are currently listed on the State of Utah's Long Range Plan, Utah Transportation 2030:

- Reconstruction of SR-13 from SR-38 to I-15
- Reconstruction of US-89 from Brigham City to near Hot Springs
- Highway and Bridge Reconstruction on SR-90 from SR-13 in Brigham City to US-91
- Congestion Mitigation and Bridge Project on US-91 from I-15 south of Brigham City to SR-90
- Reconstruction of Brigham City Interchange I-15/US-91
- Runway Extension @ Brigham City Municipal Airport
- New Construction of Brigham Welcome Center (Rest Area)

4.2 Recommended Projects

The following list identifies the eight projects that have been identified as having the highest priority to the Brigham City Transportation Advisory Committee. These needs were identified through a series of meetings where the TAC identified the needs and set priorities for projects.

- Reconstruction of Interchange, SR-91 & I-15



Technical Committee On-Site Project Visit

- New Road from SR-91 to Forest Street along 1200 West
- Commuter Rail Station, Forest Street & Train Depot
- New Interchange, SR-91 & SR-90
- Railroad Crossing Study (300 North, Forest Street, 1100 South & 400 North
- New Road into Airport
- Transportation Study Citywide
- Left Turn Phasing Warrant Study & Fog Alert Signage Warrant Study, 775 West & 1100 South (SR-91)

Also discussed was the need to identify an alternate permanent access for the property located at 400 West and 400 South as the current access will go away in the near future. The timing of this is critical as the area to the south and west is currently undeveloped.

Additionally, many concerns and issues were identified which are found on the attached list.

Transportation Needs and Cost Estimates

Location			Total Cost
Roadway Improvements	From	To	
Additional Truck Lane on SR-91	Main St.	Mantua	\$25,000,000
Railroad Overpass @ Forest St.			\$20,000,000
Interchange Study, 500 West & SR-13			\$75,000
Interchange Improvements, 500 West & SR-13			\$5,000,000
New Road, 450 West & 900 North			\$275,000
Widening, 1100 South	Main St.	I-15	\$2,000,000
Reconstruction of Interchange, 1100 South & I-15			\$25,000,000
Corridor Perservation, 900 North	Main St.	600 East	\$100,000
New Road, Airport Road	Airport	SR-13	\$225,000
Spot Improvement, Airport Road & SR-13			\$450,000
New Road, 1200 West	1100 So.	Forest St.	\$2,300,000
New Interchange, SR-90 & SR-91			\$35,000,000
Widening, Forest St.	Railroad	Bird Refuge	\$2,700,000
New Road, Highland Blvd.	100 North	200 South	\$1,000,000
Reconstruction, Main Street	900 North	1100 South	\$4,050,000
Widening, SR-13	I-15	Main St.	\$12,000,000
New Road, 400 So.	800 West	1200 West	\$1,100,000
Safety Projects			
Crosswalks, 1100 So. & Commerce			\$5,000
Speed Study, West Forest St.			\$10,000
Safe Routes to Schools Study			\$10,000/Ea.
Speed Study, Various Routes in the City			\$5,000/Ea.
Truck Route Study for gravel pits			\$50,000
Alternative Travel Modes			
Transit Hub, on 1100 South for Cache Valley Traffic			\$500,000
Commuter Rail Station, Forest St. & Train Depot			\$1,000,000
Study, City Wide Trails Plan			\$50,000
Railroad Crossing Study (300 No., Forest St., 600 No., 1100 So, & 400 So.)			\$100,000
Intersection Improvements			
Future Signal, 100 West & Forest St.			\$150,000
4-Way Stop, 1000 East & Beecher B lvd.			\$10,000
Region 1 Traffic Review, 20 No. & Main St.			\$10,000
Warrant Analysis, 200 East & 100 No.			\$10,000
4-Way Stop, 200 East & 100 No.			\$10,000

Future Signal, 200 East & 100 No.			\$150,000
Future Signal, 200 East & 200 So.			\$150,000
Safety Study, 200 So. & Gravel Pit Access on SR-90			\$10,000
Safety Study, 300 No. & Main St.			\$10,000
Safety Study, 300 So. & 600 West			\$10,000
Future Signal, 300 West & 700 So.			\$150,000
Warrant Analysis, 300 West & Forest St.			\$10,000
4-Way Stop, 300 West & Forest St.			\$10,000
Future Signal, 300 West & Forest St.			\$150,000
Alternative Access Study, 450 West & 1100 So.			\$30,000
Future Signal, Forest St. & 500 West			\$150,000
4-Way Stop, 700 So. & 500 West			\$10,000
Warrant Analysis, 500 No. Main St.			\$10,000
Future Signal, 500 West & 700 So.			\$150,000
Warrant Analysis, 600 East & 100 No.			\$10,000
4-Way Stop, 600 East & 100 No.			\$10,000
Future Signal, 600 East & 100 No.			\$150,000
Warrant Analysis, 600 East & 200 So.			\$10,000
4-Way Stop, 600 East & 100 No.			\$10,000
Future Signal, 600 East & 100 No.			\$150,000
Future Signal, 600 East & 200 So. (SR-90)			\$150,000
Warrant Analysis, 700 No. & Highland Blvd.			\$10,000
3-Way Stop, 700 No. & Highland Blvd.			\$10,000
Future Signal, 747 So. Main St. (Shopko)			\$150,000
Left Turn Phasing Warrant Study, 775 West & 1100 So.			\$10,000
Left Turn Phasing & Fog Warning, 775 West & 1100 So.			\$30,000
Upgrade Signals with Video Detection on Main St.			\$200,000
Access Study, Main St. & 1100 South			\$15,000
Left Turn Phasing, 700 So. & Main St.			\$25,000
Roundabout, 500 East & 950 So.			\$150,000
4-Way Stop, 500 East & 950 So.			\$10,000
Left turn & Right turn lanes, SR-13 & Watery Lane			\$250,000
Enhancements			
Landscape & Beautification, 1100 So. & I-15 Interchange			\$150,000
Landscape & Beautification, Forest St. & I-15 Interchange			\$150,000
Landscape & Beautification, 900 No. & I-15 Interchange			\$150,000
Landscape & Trail, 1100 So., Main St. to I-15			\$360,000

Gateway Feature, 1100 So. & Main St.			\$150,000
Sidewalks, 600 East	100 No.	700 No.	\$155,000
Bonneville Shoreline Trail			\$1,150,000
Golden Spike Rail Project (Impacts to Highway & Commuter Rail)			\$25,000
Freeway Signing for Museum			\$10,000
Mayor's Pond & Box Elder Creek Trail			\$110,000
Preserve Main Street Trees			\$50,000
Gateway Feature, SR-13 & SR-38			\$150,000
West Forest Street/Bear River Migratory Bird Refuge trail	12 mile length		\$2,600,000
Transportation Study City Wide			\$100,000
Shoshone Trail Entrance & Parking Lot			\$125,000
			\$145,965,000

4.3 Revenue Summary

4.3.1 Federal and State Participation

Federal and State participation is important for the success of implementing these projects. UDOT needs to see the Transportation Master Plan so that they understand what the City wants to do with its transportation system. UDOT can then weigh the priorities of the city against the rest of the state. It is important for Brigham City to promote projects that can be placed on UDOT's five-year Statewide Transportation Improvement Program (STIP) as soon as possible. The process for placing projects into the STIP and funding of these projects can be found at UDOT's homepage @ www.udot.utah.gov, tab on "Doing Business" select the tab for "Planning and Programming" here there is a subtopic entitled "Statewide Transportation Improvement Program (STIP)" that describes this program in detail. Additionally coordination with UDOT's Region Director and Planning Engineer will be practical.

4.3.2 City Participation

The City will fund the local Brigham City projects. The local match component and partnering opportunities vary by the funding source.

4.4 Other Potential Funding

Previous sections of this chapter show significant shortfalls projected for the short-range and long-range programs. The following options may be available to help offset all or part of the anticipated shortfalls:

- Increased transportation impact fees.
- Increased general fund allocation to transportation projects.
- General obligation bonds repaid with property tax levies.
- Increased participation by developers, including cooperative programs and incentives.
- Special improvement districts (SIDs), whereby adjacent property owners are assessed portions of the project cost.
- Sales or other tax increase.
- State funding for improvements on the county roadway system.
- Increased gas tax, which would have to be approved by the State Legislature.
- Federal-aid available under one of the programs provided in the federal transportation bill (TEA-21 is the current bill; SAFETEA will likely be passed in late 2004).

Increased general fund allocation means that General Funds must be diverted from other governmental services and/or programs. General obligation bonds provide initial capital for transportation improvement projects but add to the debt service of the governmental agency. One way to avoid increased taxes needed to retire the debt is to sell bonds repaid with a portion of the municipalities' State Class monies for a certain number of years.

Participation by private developers provides a promising funding mechanism for new projects. Developers can contribute to transportation projects by constructing on-site

improvements along their site frontage and by paying development fees. Municipalities commonly require developers to dedicate right-of-way and widen streets along the site frontage. A negative side of the on-site improvements is that the streets are improved in pieces. If there are not several developers adjacent to one another at the same time, a continuous improved road is not provided. One way to overcome this problem is for the jurisdiction to construct the street and charge the developers their share when they develop their property.

Another way developers can participate is through development fees. The fees would be based on the additional improvements required to accommodate the new development and would be proportioned among each development. The expenditure of additional funds provided by the fees would be subject to the City's spending limit. However, development fees are often a controversial issue and may or may not be an appropriate method of funding projects.

5 Planning Issues and Guidelines

Provided below is a discussion of various issues with a focus on elements that promote a safe and efficient transportation system in the future.

5.1 Guidelines and Policies

These guidelines address certain areas of concern that are applicable to Brigham's Transportation Master Plan.

5.1.1 Access Management

This section will define and describe some of the aspects of Access Management for roadways and why it is so important. Access Management can make many of the roads in a system work better and operate more safely if properly implemented. There are many benefits to properly implemented access management. Some of the benefits follow:

- Reduction in traffic conflicts and accidents
- Reduced traffic congestion
- Preservation of traffic capacity and level of service
- Improved economic benefits businesses and service agencies
- Potential reductions in air pollution from vehicle exhausts

5.1.1.1 Definition

Access management is the process of comprehensive application of traffic engineering techniques in a manner that seeks to optimize highway system performance in terms of safety, capacity, and speed. Access Management is one tool of many that makes a traffic system work better with what is available.

5.1.1.2 Access Management Techniques

There are many techniques that can be used in access management. The most common techniques are signal spacing, street spacing, access spacing, and interchange to crossroad access spacing. There are various distances for each spacing, dependant upon the roadway type being accessed and the accessing roadway. UDOT has developed an access management program and more information can be gathered from the UDOT website and from the Access Management Program Coordinator.

5.1.1.3 Where to Use Access Management

Access Management can be used on any roadway. In some cases, such as State Highways, access management is a requirement. Access management can be used as an inexpensive way to improve performance on a major roadway that is increasing in

volume. Access management should be used on new roadways and roadways that are to be improved so as to prolong the usefulness of the roadway.

5.1.1 Context Sensitive Solutions

Context Sensitive Solutions (CSS) addresses the need, purpose, safety and service of a transportation project, as well as the protection of scenic, aesthetic, historic, environmental and other community values. CSS is an approach to transportation solutions that find, recognize and incorporate issues/factors that are part of the larger context such as the physical, social, economic, political and cultural impacts. When this approach is used in a project the project become better for all of the entities involved.

5.1.2 Recommended Roadway Cross Sections

Chapter 7 of the Brigham City General Plan is entitled “Transportation and Circulation.” This chapter outlines the differing street systems and uses in the area. The history of many of the road widths is discussed in this section. The classification of each road in the area is not outlined for each street. However, the street standards for Brigham City are given.

Chapter 7 of the General Plan does outline street and right-of-way widths for each type of street (see Brigham City General Plan page 7-40). The following paragraphs provide additional discussion on cross-sections.

Cross sections are the combination of the individual design elements that constitute the design of the roadway. Cross section elements include the pavement surface for driving and parking lanes, curb and gutter, sidewalks and additional buffer/landscape areas. Right-of-way is the total land area needed to provide for the cross section elements.

The design of the individual roadway elements depends on the intended use of the facility. Roads with higher design volumes and speeds need more travel lanes and wider right-of-way than low volume, low speed roads. The high use roadway type should include wider shoulders and medians, separate turn lanes, dedicated bicycle lanes, elimination of on street parking, and control of driveway access. For most roadways, an additional buffer area is provided beyond the curb line. This buffer area accommodates the sidewalk area, landscaping, and local utilities. Locating the utilities outside the traveled way minimizes traffic disruption in utility repairs or changes in service are needed.

Federal Highway standard widths apply on the all roads that are part of the state highway system. Also, all federally funded roadways in Brigham City and Box Elder County must adhere to the same standards for widths and design.

5.2 Bicycles and Pedestrians

5.2.1 Bicycles/Trails

Bicycles are allowed on all roadways, except where legally prohibited, and as such should be a consideration on all roads that are being designed and constructed, and as

roadway improvements are taking place. To increase the level of interest in bicycling in the Brigham City area, the City should encourage developers to include separate bicycle/pedestrian pathways in all new developments. Opportunities to include bike lanes and increased shoulder width in conjunction with a roadway project should be taken whenever technically, environmentally, and financially feasible. The City is encouraged to follow the directions laid out in their General Plan in developing a detailed bicycle plan, and also support the Cold Water Canyon trail as described in Chapter 2 of this Plan.

It is important to note that regardless of the system's function, as the bike/trail facilities are planned, designed and constructed, the City should review the connectivity of the trails systems. With input from the community, a review of the connectivity of the trails should play an integral role in the decision making process for potential projects. In order to enhance the quality of life for those in the community, the trails should be accessible to all users and incorporate ADA requirements.

The trails, when constructed, may have slight variances in application type due to possible differences in the terrain at a specific trail location or differing user needs. However, regardless of the design type, the applicable design standards found in the latest version of the AASHTO Guide for the Development of Bicycle Facilities should be followed, as well as the Manual on Uniform Traffic Control Devices (MUTCD) guidelines for appropriate signage of the trails system.

5.2.2 Pedestrians

Every effort should be made to accommodate pedestrians throughout Brigham City. An opportunity to include accessible sidewalks, while adhering to ADA requirements, during construction of other projects is encouraged. For the safety and convenience of pedestrian traffic, sidewalk placement should be free from debris and obstructions or impediments such as utility poles, trees, bushes, etc. The City should conduct a sidewalk inventory to document locations where there may be gaps or safety concerns in the sidewalk system. Effort should then be made to construct and complete the sidewalks where gaps or problems occur. This effort may coincide with Brigham City's Streets Department 2004-2005 sidewalk and curb & gutter replacement project.

In Section 2.8 of this Plan, reference was made to recent city developments that have resulted in fewer sidewalks being installed and longer uninterrupted streets, thus making for less interconnectedness of the City's network. Brigham City should work toward completing the sidewalks system, particularly in the northeast quadrant, and set policy for sidewalk installation to ensure continuity of a street system that includes pedestrian needs. Developers should be required to include sidewalk placement or improvements in their respective project development plans.

Sidewalks in residential areas should be at least 5-feet wide whenever adequate right-of-way can be secured. This will provide sufficient room and a level of comfort to persons walking in pairs or passing and will specifically allow for persons with strollers or in wheelchairs to pass. On major roadways, sidewalks at least 6-feet wide and with a 6 to 10-foot park strip are desirable. In pedestrian-focused areas, such as schools, parks, sports venues or theaters, and in hotel and market districts, even wider sidewalks are

recommended to accommodate and encourage a higher level of pedestrian activity, especially where tourist use would be expected. To ensure consistency of sidewalks throughout the area, UDOT's approved standard for sidewalks should be followed.

In addition to the possible funding sources referred to in Brigham City's General Plan, there may be opportunity for the City to make improvements to their sidewalk system through the Utah Department of Transportation's Safe Sidewalk Program, available through the Traffic and Safety Division. The City should contact UDOT's Region One office for application requirements.

The City should be aware of, and coordinate with, the area schools that are tasked with developing a routing plan to provide a safe route to school. The routing plan is to be reviewed and updated annually. Information regarding the Safe Routes to School program is available by contacting the Utah Department of Transportation's Traffic and Safety Division.

5.3. Enhancements Program

In 1991, the Intermodal Surface Transportation Efficiency Act (ISTEA) created the Transportation Enhancement program. The program has since been reauthorized in subsequent bills (i.e. TEA-21). The Transportation Enhancement program provides opportunities to use federal dollars to enhance the cultural and environmental value of the transportation system. These transportation enhancements are defined as follows by TEA-21:

The term 'transportation enhancement activities' means, with respect to any project or the area to be served by the project, any of the following activities if such activity relates to surface transportation: provision of facilities for pedestrians and bicycles, provision of safety and educational activities for pedestrians and bicyclists, acquisition of scenic easements and scenic or historic sites, scenic or historic highway programs (including the provision of tourist and welcome center facilities), landscaping and other scenic beautification, historic preservation, rehabilitation and operation of historic transportation buildings, structures, or facilities (including historic railroad facilities and canals), preservation of abandoned railway corridors (including the conservation and use thereof for pedestrian or bicycle trails), control and removal of outdoor advertising, archeological planning and research, environmental mitigation to address water pollution due to highway runoff or reduce vehicle caused wildlife mortality while maintaining habitat connectivity, and establishment of transportation museums.

The Utah Transportation Commission, with the help of an advisory committee, decides which projects will be programmed and placed on the Statewide Transportation Improvement Program (STIP). Applications are accepted in an annual cycle for the limited funds available to UDOT for such projects. Information and Applications for the current cycle can be found on UDOT's homepage @ www.udot.utah.gov, tab on "Doing Business" select "Planning and Programming", here you will find a sub-topic entitled "Transportation Enhancement

Program”. Applications must be received by the UDOT Program Development Office, on or before the specified date to be considered. Projects will compete on a statewide basis.

5.4. Transportation Corridor Preservation

Transportation Corridor Preservation will be introduced as a method of helping Brigham’s Transportation Master Plan. This section will define what Corridor Preservation is and ways to use it to help the Transportation Master Plan succeed for the City.

5.4.1. Definition

Transportation Corridor Preservation is the reserving of land for use in building roadways that will function now and can be expanded at a later date. It is a planning tool that will reduce future hardships on the public and the city. The land along the corridor is protected for building the roadway and maintaining the right-of-way for future expansion by a variety of methods, some of which will be discussed here.

5.4.2. Corridor Preservation Techniques

There are three main ways that a transportation corridor can be preserved. The three ways are acquisition, police powers, and voluntary agreements and government inducements. Under each of these are many sub-categories. The main methods will be discussed here, with a listing of some of the sub-categories.

5.4.2.1 Acquisition

One way to preserve a transportation corridor is to acquire the property outright. The property acquired can be developed or undeveloped. When the city is able to acquire undeveloped property, the city has the ability to build without greatly impacting the public. On the other hand, acquiring developed land can be very expensive and can create a negative image for the City. Acquisition of land should be the last resort in any of the cases for Transportation Corridor Preservation. The following is a list of some ways that land can be acquired.

- Development Easements
- Public Land Exchanges
- Private Land Trusts
- Advance Purchase and Eminent Domain
- Hardship Acquisition
- Purchase Options

5.4.2.1. Exercise of Police Powers

Police powers are those ordinances that are enacted by a municipality in order to control some of the aspects of the community. There are ordinances that can be helpful in preserving corridors for the Transportation Master Plan. Many of the ordinances that can be used for corridor preservation are for future developments in the community. These can be controversial, but can be initially less intrusive.

- Impact Fees and Exactions
- Setback Ordinances
- Official Maps or Maps of Reservation
- Adequate Public Facilities and Concurrency Requirements

5.4.2.2. Voluntary Agreements and Governmental Inducements

Voluntary agreements and governmental inducements rely on the good will of both the developers and the municipality. Many times it is a give and take situation where both parties could benefit in the end. The developer will likely have a better-developed area and the municipality will be able to preserve the corridor for transportation in and around the development. Listed below are some of the voluntary agreements and governmental inducements that can be used in order to preserve transportation corridors in the city limits.

- Voluntary Platting
- Transfer of Development Rights
- Tax Abatement
- Agricultural Zoning

Each of these methods has its place, but there is an order that any government should try to use. Voluntary agreements and government inducements should be used, if possible, before any police powers are used. Police powers should be tried before acquisition is sought. UDOT has developed a toolkit to aid in corridor preservation techniques. This toolkit contains references to Utah code and examples of how the techniques have been used in the past.